Lucky Peak Dam
Page 10

620

Contractors and Engineers

NOVEMBER 1953

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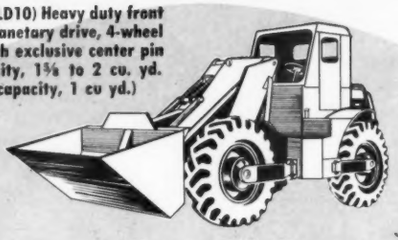
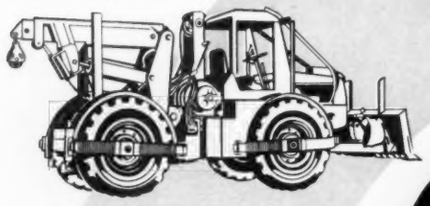
A section of reinforced-concrete pipe is cast at the site of a sanitary sewer project. As a Wagner Scoopmobile discharges its load of concrete, the Quinn steel form is vibrated by Vibro-Plus external units. Page 50.

SCOOPMOBILE (Model LD10) Heavy duty front end loader. 4-wheel planetary drive, 4-wheel power steering through exclusive center pin hinge coupling. Capacity, 1⅝ to 2 cu. yd. (Smaller Model LD5—capacity, 1 cu yd.)

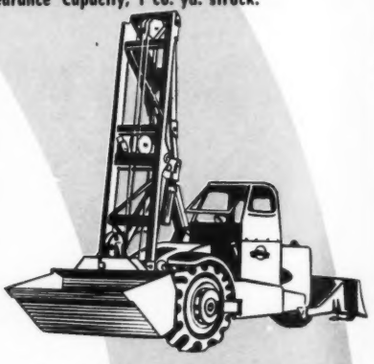


DUO-WAY SCOOP. Dozer at one end, scoop at other. Shovels, loads, transports, dozes, backfills. Four speeds either direction. (Model DS2H—capacity, 1 cu yd. struck; Model DS3H—capacity, 1½ cu. yd. struck).

LOGGERMOBILE. (Model LG10) 4-wheel drive, 4-wheel power steering. Hydraulically operated live arch and telescoping boom. Planetary drive winch. All purpose logger—skids, arch logs, loads.



DUO-WAY SCOOP (Model DS2B) Scoop at one end, dozer at other. Side-saddle operator position. Upper track folds hydraulically for clearance Capacity, 1 cu. yd. struck.

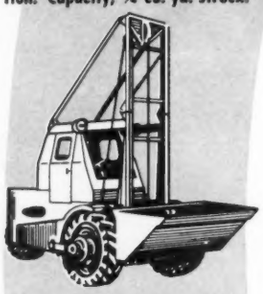


SCOOPMOBILE (Model H) Shovels, loads, transports all types of bulk materials. Four speeds either direction. Capacity, ¾ cu. yd. struck.

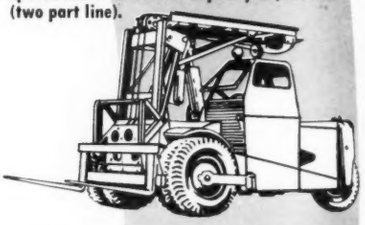
the MIXERMOBILE Production Line

MIXERMOBILE MANUFACTURERS

SCOOPMOBILE (Model C) Scoops, hoists, stacks and loads. Four speeds either direction. Capacity, ¾ cu. yd. struck.



DUO-WAY LIFT (Model DL2B) Transporter and heavy-duty lift truck with folding truck. Four speeds either direction. Capacity 12,000 lbs. (two part line).



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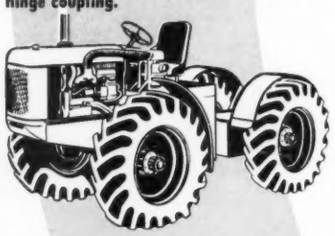

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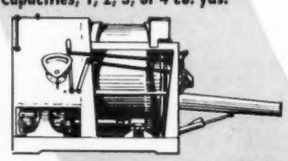
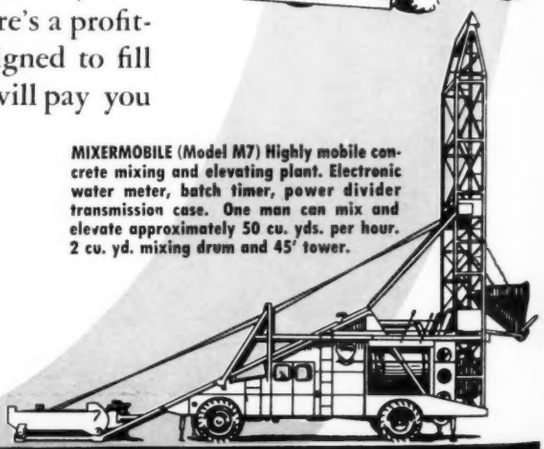


MIXERMOBILE (Model M7) Highly mobile concrete mixing and elevating plant. Electronic water meter, batch timer, power divider transmission case. One man can mix and elevate approximately 50 cu. yds. per hour. 2 cu. yd. mixing drum and 45' tower.



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EDITORIAL

Fresh Air Is Not Enough

Time was that when the young engineer employed by a state highway department asked for a raise in salary, he was jokingly put off with a reminder of the great advantage of working outdoors in the clean fresh air. His contemporary in age and education, employed in an office or shop, might be earning more money, but that way of livelihood should not be compared with an engineering career in the wide open spaces where the sky is always blue and the sun always warm and friendly. This rose-tinted picture of highway employment, with its nonpecuniary advantages, was accepted tolerantly when there were more than enough highway engineers to go around. But the low pay offered to highway engineers soon became a major factor in the steady decline of civil engineer graduates from our colleges.

A recent survey by the American Road Builders' Association reveals that in this year alone the number of civil engineer graduates falls short of the over-all demand by 13,000. Of this total, approximately 3,500 account for the shortage of highway engineers. Many public agencies, naturally, are hardest hit since they have been unable to compete with the more remunerative salaries offered in private employment. What to do about it?

The ARBA is offering help with a program to improve the status of highway engineers and to establish salaries and benefits commensurate with those offered by private industry. Probably the most important part of this program is the proposed increase in highway salaries to levels that will both hold present employees and attract new ones.

Some points in the ARBA program are intended to glamorize and publicize the highway engineering profession; to arrange student inspection trips by highway departments; to get the cooperation of highway departments and engineering colleges in joint highway conferences; and to promote summer work with the highway departments for student engineers.

Through these last two means particularly, the Michigan Road Builders' Association, the Michigan State Highway Department, and the University of Michigan are making a specific attempt to solve the current highway engineer shortage in their state. These three groups are sponsoring a pioneer approach to the problem by starting at the high school level to recruit future engineers. From high school graduating classes, 30 young men were selected this past summer to attend an experimental course at the University of Michigan's survey camp, for the purpose of interesting them in civil engineering and highway work. Details of the Michigan plan are described in the article "Michigan Recruits Civil Engineers", on page 34 of this issue.

The MRBA helped substantially in financing the plan. The University's Civil Engineering Department developed a program of instruction for this eight-week surveying course that might well be considered by other technical colleges. The U. of M. also gave credit to those students who completed the course successfully and wished to continue the study of civil engineering at the University. The highway department, ranking among the top ten in the country in its pay rate for engineers, offered the trainees jobs with starting salaries that compared favorably with those in private industry. Their program recognizes that young men embarking on a career of highway engineering, such as those pictured above at the University of Michigan's survey camp, should no longer be paid partly in money and partly in free fresh air.

News and Views

High on the agenda of the National Highway Conference when it meets next month in the nation's capital is the subject of **improved streets and highways** and their financing. Meeting under the sponsorship of the National Chamber of Commerce, the conference is expected to clarify opinion on these problems before Congress convenes next year to recast its Federal-aid highway program.

Even as the conference prepares to get under way, states trying to cope with highway financing needs are giving more emphasis to the problem. It is estimated that Louisiana will need half a billion dollars in addition to regular funds to finance an **adequate highway construction** program. A survey of Louisiana's road requirements is now being made and will be studied by a special session of the legislature. One senator claims the need for adequate roads is particularly pressing since Louisiana, an urban rather than a rural state since 1950, has developed traffic bottlenecks which must be overcome. He feels that highway-user taxes seem to be the only answer for the state.

Much the same can be said for Oklahoma. About 40 million dollars will be available to the state highway commission in the current fiscal year, but this, according to the governor, will not go far. With **construction lagging behind replacements,** the highway department feels that at least 740 million dollars is needed to bring the roads up to par.

The job of keeping Idaho roads in good condition is working out very well, state road officials claim. Under the state's new program, almost every mile in the 4,700-mile system is patrolled **every working day by a maintenance man.** One man is assigned to a section from 15 to 30 miles in length and held responsible for keeping that section in safe and comfortable condition. More than 600 men are employed on the project.

Maintenance and construction funds for Wisconsin should come from an increase in gasoline taxes, according to a resolution adopted by the state's Automotive Trade's Association. This group, together with the Automobile Manufacturers' Association, has also passed a resolution urging the start of a **"feasible junking program"** that would help remove permanently unsafe vehicles from the highways.

Weighing 150 tons, Canada's largest derrick works on a refinery in Sarnia. It is equipped with a 160-foot boom, 20-foot-diameter bull wheel, and 180-foot mast mounted on a spherical roller thrust bearing. Dominion Bridge Co., Ltd., designed the derrick, built at the company's Lachine shops.

San Marcos span in El Salvador, half a mile in length, is the first not to use stiffening trusses or girders:

Initial All-Cable Suspension Bridge

Floor steel is erected for the main 670-foot span on the half-mile-long bridge. Of the five spans, two are 520 feet long and two are 250 feet long.

THE FIRST all-cable highway suspension bridge ever built—a bridge using no stiffening trusses or girders and having no vertical suspension ropes—has been completed over the Rio Lempa in El Salvador, Central America. The new San Marcos Bridge is, in effect, a section of concrete highway suspended in mid-air solely by webs of wire rope attached to the two main cables.

It is located on the new coastal highway about 50 miles southeast of the capital city of San Salvador and is part of an extensive farm-to-market construction program which the government of El Salvador estimates will be completed next year. Eventually, a paved highway will go from San Salvador through the departmental capital cities of Zacatecoluca and Usulutan to San Miguel, where it will rejoin the main Pan American highway.

The $2,500,000 bridge, one of the longest in Latin America, was built by The John A. Roebling's Sons Corp., Trenton, N. J., a subsidiary of The Colorado Fuel & Iron Corp. About ½ mile in length, its five suspended spans use the novel cable truss system which carries all dead and live loads by means of a network of diagonal cables acting as web members of a truss.

Earthquake-Resistant

Although lighter and more fragile in appearance than conventional suspension bridges, the new structure is said to be even more resistant to earthquakes and tropical hurricanes, which occur regularly in Central America. The complete lack of heavy steel girders gives the bridge a grace unattainable in conventional suspension bridges.

The basic idea behind the diagonal stays is not new. It was used on the Brooklyn Bridge and on earlier structures. The principle makes possible suspension bridges much less bulky in appearance. The design used in the San Marcos Bridge is the culmination of a series of developmental steps by Roebling engineers. It was first tried on a small interoffice footbridge at Roebling's Trenton plant. Later, a five-span footbridge employing the principle was built across the Delaware River at Lumberville, Pa. The same basic ideas were employed in a design development for the Corps of Engineers, U. S. Army, during World War II.

The San Marcos Bridge carries the roadway at a high level because of the danger of heavy flash floods. The longest of the five spans has a

(Concluded on next page)

Building an ASPHALT highway by the "stage construction" method

South Dakota State Highway near Faulkton, after 10-year-old road-mixed Asphalt surface had been resurfaced with hot-mix Texaco Asphaltic Concrete

Spreading and compacting the new plant-mixed Texaco Asphaltic Concrete pavement, constructed by Megarry Brothers of St. Cloud, Minn.

South Dakota employed the "stage construction" method in improving this 16-miie section of State Highway with Asphalt. The first step was taken 10 years ago, when a Slow-curing Asphaltic Oil and crushed gravel were road-mixed on the highway to provide a smooth, dustless, all-weather riding surface 4 inches thick.

In 1952, after it had served traffic satisfactorily for a number of years, the road-mixed Asphalt surface provided the State with an excellent base for a heavy-duty Texaco Asphalt pavement of the plant-mixed type. The new pavement consisted of a 1-inch leveling course, spread by blade grader, and a 1½-inch wearing surface, laid by mechanical paver. A seal coat of Texaco Rapid-curing Cutback Asphalt, covered with crushed gravel, completed the pavement.

Improvement of a highway with Texaco Asphalt products by the "stage construction" method enables the road builder to keep pace with the demands of increasing traffic, while spreading costs over a number of years.

Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the public official a wide choice of improvements for his streets or highways. Helpful information about all of these types is presented in two booklets, which you can secure with no obligation by writing our nearest office.

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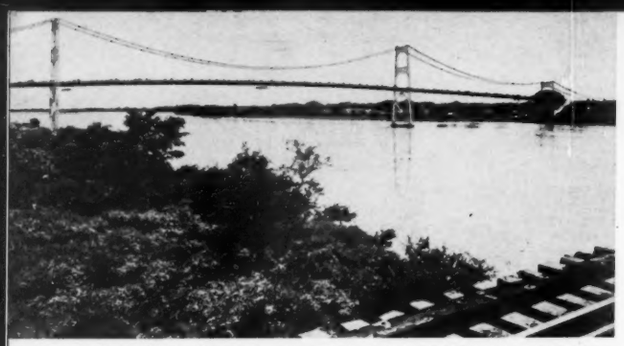
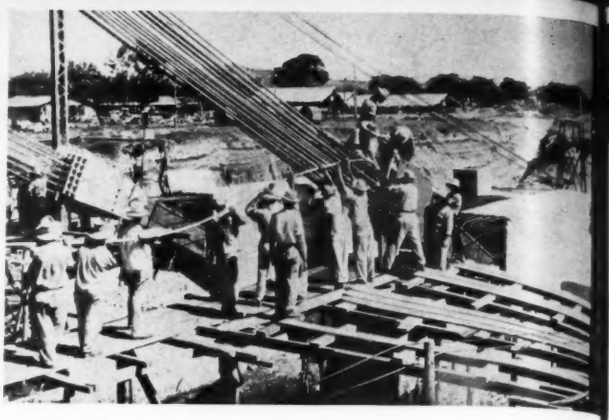


A new link in the Pan-American Highway is the 2,547-foot-long San Marcos Bridge over the Rio Lempa in El Salvador. Built at a cost of $2,500,000, it is one of the longest bridges in Latin America and the first all-cable highway suspension bridge ever built.

Workers pull the end of one of the last cable strands into position in the cable anchor. The five spans on the suspension bridge are supported by Roebling wire rope attached to the two main cables.



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Initial All-Cable Suspension Bridge

(*Continued from preceding page*)

length of 670 feet; the intermediate spans are about 520 feet long; and the end spans about 250 feet in length. Seven additional girder spans at the ends bring the total length of the bridge to approximately 2,547 feet.

Each of the two main cables consists of 24 galvanized bridge strands of 1½ inches in diameter. The main cables are of open strand construction with special cable bands. Steel connectors clamp the 24 main-cable strands in four groups of six each at all intersections of main cables and diagonals.

The diagonal cables, extending from the main cables to the lower-chord cables and back again, consist of one or two 1⅜-inch-diameter galvanized bridge ropes. Eight 1⅜-inch-diameter galvanized strands make up each of the two lower-chord cables.

Prestressing

The cable truss was prestressed by inducing bending moments at dead load in the opposite sense to those produced by live load. This was accomplished by adjusting the diagonal system to a condition of zero bending moment under dead load plus one-third live load.

The steel edge girders were made of 36-inch WF beams. Forming a continuous girder over all five spans, the beams have practically no effect on the stiffness of the bridge, functioning primarily as supports for the bridge deck between cable-truss panel points.

Because of the unfinished roadway to the bridge, it was necessary to build a complete camp, including warehousing and construction equipment buildings, as well as houses and offices for supervisory personnel. All this was done before the project was started. Crushing and screening facilities were also brought in to manufacture coarse aggregate.

Due to the lush tropical climate, a gang of laborers, using machetes for sickles, was assigned to a continuous grass-cutting detail to keep the rainy-season growth under control. Even fence posts sprouted and became trees if they were not regularly pruned.

Roebling designed the bridge, manufactured the wire rope for it, and supervised the actual building. Blair Birdsall is chief engineer of the bridge division. THE END

Convention Calendar

November 19-20 Highway and Surveying Conference
Highway and Surveying Conference, University of Florida, Gainsville, Fla. Thomas L. Brandford, associate professor of civil engineering, University of Florida, Gainsville, Fla.

November 30-December 3 American Institute of Steel Construction
Convention, American Institute of Steel Construction, Boca Raton Hotel, Boca Raton, Fla. L. Abbett Post, executive vice president, 101 Park Ave., New York 17, N. Y.

December 14 Bituminous Concrete Producers
Ninth Annual Convention of Bituminous Concrete Producers Association, Waldorf Astoria Hotel, New York City. Gus Rayner, executive secretary, Box 667, Albany, N. Y.

January 5-7, 1954 Northeastern Weed Control Conference
Northeastern Weed Control Conference, Hotel New Yorker, New York, N. Y. Walter C. Jacob, secretary-treasurer, Department of Vegetable Crops, Cornell University, Ithaca, N. Y.

January 5-7 American Road Builders' Assoc.
Meeting, American Road Builders' Association, Hotel Chalfonte-Haddon Hall, Atlantic City, N. J. Norman T. Almquist, administrative services manager, World Center Bldg., Washington 6, D. C.

January 12-14 National Constructors
Annual Meeting, National Constructors' Association, Hotel Commodore, New York, N. Y. C. B. Bronson, secretary-treasurer, 50 E. 41st St., New York, N. Y.

January 12-15 Highway Research Board
Annual Meeting, Highway Research Board, Academy of Sciences, Washington, D. C. Fred Burggraf, director, 2101 Constitution Ave., Washington 25, D. C.

January 12-15 American Society of Photogrammetry
Semi-annual Meeting, American Society of Photogrammetry, Shoreham Hotel, Washington, D. C. C. Earl Palmer, secretary-treasurer, American Society of Photogrammetry, 1000 11th St., Washington 1, D. C.

January 31-February 4 Associated Equipment Distributors
Thirty-fifth Annual Meeting, Associated Equipment Distributors, Waldorf-Astoria Hotel, New York, N. Y. P. D. Herman, executive secretary, 30 E. Cedar St., Chicago, Ill.

February 1-3 Assoc. of Asphalt Paving Technologists
Annual Meeting and Technical Sessions, Association of Asphalt Paving Technologists, Kentucky Hotel, Louisville, Ky. Ward K. Parr, secretary-treasurer, Box 376, Ann Arbor, Mich.

February 15-19 National Ready Mixed Concrete Association and National Sand and Gravel Association
Twenty-fourth Annual Convention of NRMCA and the thirty-eighth Annual Convention of the National Sand and Gravel Association, Conrad Hilton Hotel, Chicago, Ill. Vincent P. Ahern, executive secretary, 1325 E St., N. W., Washington, D. C.

March 15-19 Assoc. of Corrosion Engineers
1954 Annual Conference and Exhibition, National Association of Corrosion Engineers, Municipal Auditorium, Kansas City, Mo. A. B. Campbell, executive secretary, 1061 M&M Bldg., Houston, Texas.

Daniel Construction Receives AFA Award

The Daniel Construction Co., Greenville, S. C., has received the second annual award of the seventh district of the Advertising Federation of America for the most outstanding job of advertising in the south during the past year.

The Daniel firm received the honor for its intensive advertising campaign during 1953 in *Fortune* magazine. The certificate of award describes the construction firm as one "whose consistently effective advertising program, so well conceived and executed, has brought great distinction to its company and noteworthy attention to the South."

Review of ASTM Research

A 22-page booklet, "Review of ASTM Research", has been prepared by the administrative committee on research of the American Society for Testing Materials. It summarizes the reports of 62 major research committees, lists new activities of these committees, and brings their earlier projects up to date. It includes reports on investigations of metal, cement, ceramic, wood, rubber, and other materials.

The reports bring the work of the various technical committees of ASTM up to date as of May, 1953. The data had previously been published in the December, 1952, January, 1953, and February, 1953, ASTM bulletins.

The administrative committee has recently published a list of "Unsolved Problems." This pamphlet is intended to stimulate research in the suggested fields.

Both publications may be obtained, without charge, from ASTM headquarters, 1916 Race St., Philadelphia 3, Pa.

Concrete Supplier

Concrete and concrete equipment for the new high-level bridge at Savannah, Ga. (See C. & E., August, 1953, pg. 10, Savannah River Bridge Gets Under Way) is being supplied by the Whitley Construction Co., Decatur, Ga. The firm is providing the high-early concrete for the precast trestle piles and the standard concrete for the piers, as well as all the mixers, pavers, and other plant equipment on the Savannah side of the river and on Hutchinson Island.

Why Sellin Bros. are sold on **CAT*** performance

Harold and Roy Sellin, Hawley, Minn., are strong for the D8 Tractor and No. 80 Scraper. They say: "For success in earthmoving, buy Caterpillar!"

Building a mile of farm-to-market road near Hitterdal, Minnesota, Sellin Bros. made excellent time in spite of wet, boggy conditions. Their equipment on this job included four Caterpillar D8 Tractors and two No. 80 Scrapers.

The big units averaged 6 round trips per hour, carrying loads up to 22 cubic yards of heavy material, over a haul distance of 500 feet. Together the scrapers moved about 3,000 cubic yards in a 12-hour day. The earth handled was black loam and heavy, wet clay, and part of the haul was through standing water.

Here's what Harold and Roy Sellin say about their machines: "Caterpillar equipment is the best made, and durability is the outstanding feature. The No. 80 Scrapers load much faster and easier than other makes of machines, and production is higher."

When you're buying a scraper, look at your *last* cost *first*. Compare the Cat No. 80 or the new No. 90 with any other make on cost per yard. Then figure the cost of repairs and down time. You'll find Caterpillar Scrapers not only *outperform* but *outlast* other makes, in every kind of going.

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Names in the News

MacLeod Is Nominated AGC President for '54

John MacLeod, vice president of The Associated General Contractors of America for 1953, was nominated president of the association for 1954 at a meeting of the AGC Governing and Advisory Boards held in Chicago's Edgewater Beach Hotel. George C. Koss, this year's chairman of the AGC Public Relations Committee and a member of the Executive Committee, was nominated vice president. Voting will be held by letter ballot next month, and installation of officers will be made at the conclusion of the annual AGC convention to be held in Los Angeles in March.

Mr. MacLeod, president of Macco Corp., Paramount, Calif., since 1929, is known as a builder of dams, Army and Navy installations, and industrial facilities, particularly those for the oil industry. In addition to his current term as AGC vice president, Mr. MacLeod has served as a member of the Executive and Finance committees and the Construction Industry Manufacturers Association—an AGC joint cooperative committee.

Mr. Koss is president of the Koss Construction Co., Des Moines, Iowa, which has built a number of major air bases in the midwest. He also serves on two joint cooperative committees of the AGC—the American Association of State Highway Officials and the Construction Industry Manufacturers Association. He is a director from District 6, representing North and South Dakota, Iowa, and Minnesota.

John MacLeod, 1954 AGC president.

Terrell New ASCE Head

Daniel V. Terrell, dean of the College of Engineering, University of Kentucky, has been elected president of the American Society of Civil Engineers, succeeding Walter L. Huber. He will serve for one year.

Two vice presidents and six directors have also been elected for two and three-year terms.

Dean Terrell, a former vice president and director of the ASCE, was graduated from the University of Kentucky in 1910 and has been on its faculty for 40 years. He has been dean of the College of Engineering and director of the Engineering Experiment Station at the university since 1946. He has been president of the Kentucky Society of Professional Engineers and president of the Kentucky section of the ASCE. Since 1942, he has been a director of the Kentucky State Highway Research Laboratory.

Daniel V. Terrell was installed October 21, 1953, as president of the American Society of Civil Engineers.

The new vice presidents are Enoch R. Needles for Zone 1 and Mason G. Lockwood for Zone 4. The new directors are William S. LaLonde, District 1; Oliver W. Hartwell, District 4; Thomas W. Shedd, District 8; Samuel B. Morris, District 11; Ernest W. Carlton, District 14; and Raymond F. Dawson, District 15.

Haber is Appointed

Richard A. Haber has been appointed executive engineer for Michael Baker, Jr., Inc., Rochester, Pa., consulting engineers. His responsibilities will be in the field of highway development and design.

Mr. Haber has been associated with the Delaware State Highway Department since 1936.

Lt. Hassett Reassigned

First Lt. Bernard T. Hassett has been assigned as a military assistant to the district engineer, St. Louis District, Upper Mississippi Valley Division, Corps of Engineers, U. S. Army. A graduate of Rensselaer Polytechnic Institute, Lt. Hassett is a veteran of World War II and the Korean conflict.

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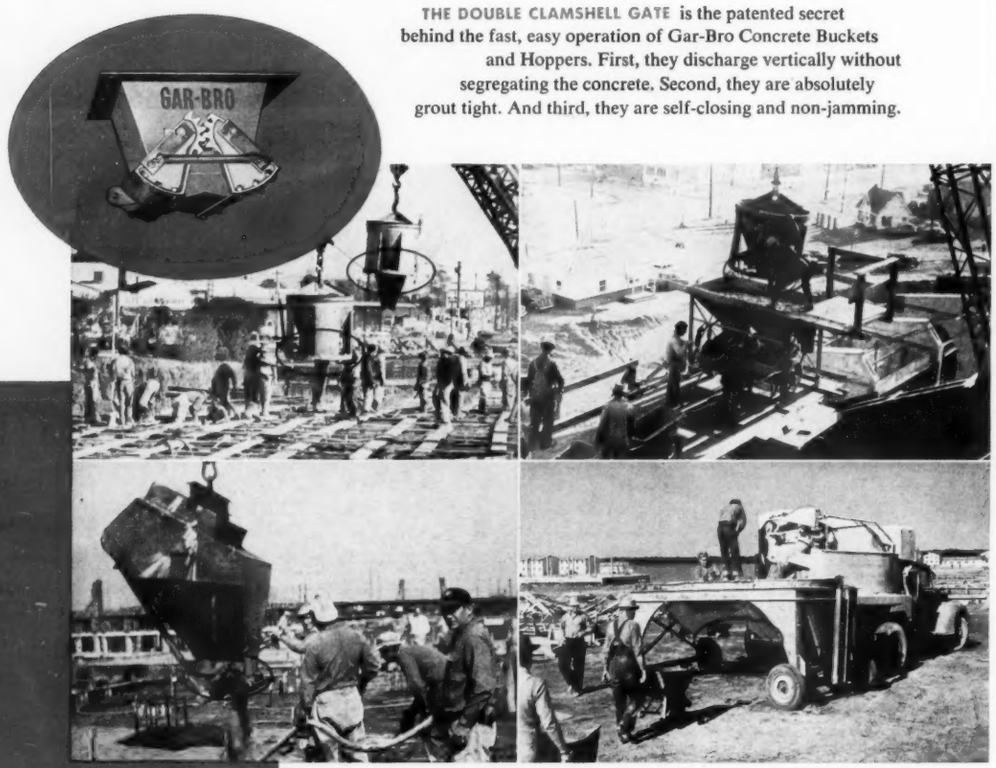

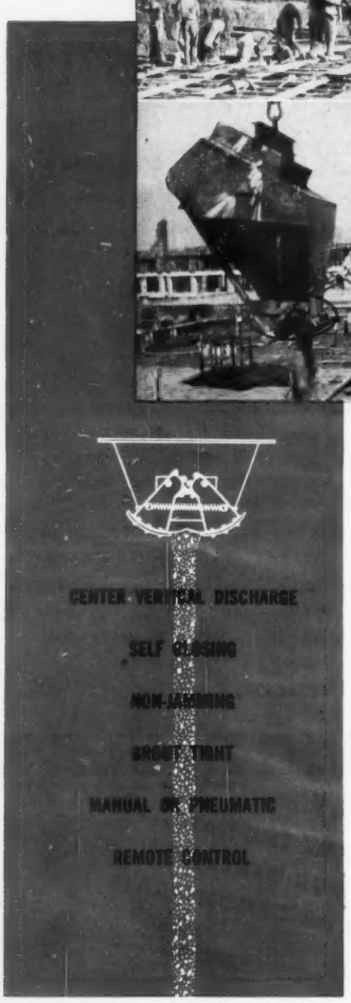

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George W. Llewellyn, H. K. Ferguson Co.

Llewellyn Is Appointed

George W. Llewellyn has been appointed manager of the H. K. Ferguson Co. western district office which has just been established at 74 Montgomery St., San Francisco, Calif.

Mr. Llewellyn has been with the Ferguson firm for nine years. For the past two years, he has been project manager of the multimillion dollar metallic titanium plant completed last month by the Ferguson Co. for the Titanium Metals Corp. of America at Henderson, Nev.

The new branch office is staffed and equipped to offer complete engineering services and includes purchasing, estimating, accounting, and sales departments. It covers the states of California, Washington, Oregon, Idaho, Nevada, Utah, and Arizona.

Harold E. Hilts Dies

Funeral services for the late Harold E. Hilts, deputy commissioner of the Bureau of Public Roads were held in Philadelphia, Pa. He had been with the bureau since 1936, serving principally as deputy commissioner in charge of design.

For the past seven years, Mr. Hilts had been chairman of the committee on planning and design policies of the American Association of State Highway Officials. He was also a member of the UN group of experts on road signs and signals.

In 1947, as chief of the highway mission from the U. S. to Turkey in connection with the Aid to Turkey program, he helped the Turkish Ministry of Public Works establish a long-range highway improvement plan and a pattern for highway administration on a national scale. A native of Pennsylvania, he received his degree in civil engineering from the University of Pennsylvania in 1905.

Victor M. Cone Retires

Climaxing 37 years of Federal service, Victor M. Cone, chief engineering assistant and head of the engineering division of the Nashville District, U. S. Army Corps of Engineers, has retired.

Mr. Cone, the inventor of the original Venturi Flume, has made a number of contributions to the fields of hydraulics and hydrology. His work has involved irrigation drainage, flood control, water power, and navigation.

Rubber Bureau Expands

Earl H. Brengle and Ralph E. Davis have been named traveling technical engineers for the eastern and central sections of the U. S. by the National Rubber Bureau, 1631 K St., N.W., Washington 6, D. C. William J. Ryan will cover the west temporarily.

The bureau, which has a research laboratory in Rosslyn, Va., operates a highway laboratory service to aid communities contemplating the laying of natural rubber roads. In addition, it maintains a consulting engineering service which is available without charge.

All the newly appointed men have had special training in the technique of laying rubber pavement and will provide technical assistance to communities desiring it.

Mr. Brengle will make his headquarters in Baltimore, and Mr. Davis will operate from St. Louis, Mo.

R. E. DeSimone Retires

Ralph E. DeSimone has retired as director, president, and board chairman of Merritt-Chapman & Scott Overseas, Inc., a subsidiary of Merritt-Chapman & Scott Corp., New York City, after 37 years of service. His duties have been assumed by William Denny, executive vice president and general manager.

Adm. Jelley Named

Rear Admiral Joseph F. Jelley, Jr., USN, has been named director of construction in the office of Assistant Secretary of Defense (Properties and Installations), Franklin G. Floete. He will assume his new duties at the conclusion of his term as Chief of the Bureau of Yards and Docks, Department of the Navy.

Rear Admiral Joseph F. Jelley, USN.

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An aerial view of the Lucky Peak Dam project. Haul road tracks crisscross the area. The $22,000,000 dam is being constructed by the Corps of Engineers primarily for flood control on the Boise River. *Photo courtesy of Walla Walla District, Corps of Engineers*

Moving Dirt for Lucky Peak Dam

Steep haul roads and scattered borrow areas are problems on project involving 6,723,600 yards of earthwork

By RAY DAY

One of the Bucyrus-Erie 54-B shovels at work in the upper borrow pit loading a Caterpillar DW20 hauling unit.

WORKING WITH STEEP haul grades and scattered borrow pits, the Boise, Idaho, construction firm of Morrison Knudsen Co., Inc., together with other contractors, is pushing the last earth stage of Lucky Peak Dam toward rapid completion ten miles upriver from Boise. M-K's $3,650,000 earthfill contract is part of the $22,000,000 Lucky Peak project being built primarily for flood control on the Boise River by the Corps of Engineers.

Started in 1950, long before the M-K contract was let, Lucky Peak Dam is expected to be finished by 1955.

With a relatively small fleet of earth-moving equipment, M-K is ramming a total of 10,000 cubic yards per eight-hour day into the upper limits of the structure. Earthwork is beginning to overtake highway relocation around the dam; the highballing dirt men may have to taper in with a sloping wedge under

crest elevation until highway builders can get out of the way.

M-K's crews deserve only part of the credit, however. The dam-building contract is a joint-venture, including, in addition to M-K, J. A. Terteling & Sons, Boise; Macco Corp., Paramount, Calif.; and Puget Sound Bridge & Dredging Co., Seattle, Wash. All the firms are represented on the project, with Owen J. Daly, a veteran M-K dirt man, in charge as project manager.

Stage Contracts Let

The Corps of Engineers called for bids on Lucky Peak Dam in several stages. One of the first contracts, for a major diversion tunnel to carry the Boise River through the site during construction, was drilled by Macco Corp. and Puget Sound Bridge & Dredging Co. The relocation of six miles of state highway was a job for Carl M. Halvorson, Inc. Roy L. Bair & Co., a Spokane, Wash., contractor, was awarded the Mores Creek bridge contract, necessary as part of the highway relocation because of the raised reservoir level.

Another highway relocation contract, from Mores Creek to Arrowrock Dam, is being done by McNutt Bros. of Eugene, Oreg. The finish contract, which calls for completion of the intake tower, outlet works, and the spillway, is in the hands of the joint-venture firm of Russ Mitchell, Inc. and Bruce Construction Co., of Ft. Worth, Texas.

No Easy Dirt Work

From the very start, earthwork has been anything but easy. Lucky Peak Dam is located between two outcropping basalt cliffs along the Boise River, and it was not easy to design the earthfill portion of the structure. A dam with a crest length of 1,700 feet and a maximum height above the stream bed of 260 feet was needed to dam up the stream. This is 350 feet above low bottom of the core trench, at a general elevation of 3,078 feet above sea level. Economics practically dictated a rolled earth and gravel fill structure.

But materials for such a design were scattered throughout the area around the dam site. Some were upstream, beyond the left abutment, and some were downstream or to the sides. This setup has brought about a situation where hauling units must climb a 16 per cent haul road to get under shovels at the top of a mountain and must descend a 10 per cent slope on their way to the fills.

The amount of yardage involved is approximately 6,723,600 cubic yards. This includes 145,000 cubic yards of rock riprap, used for slope protection both upstream and downstream on the dam faces.

When the earthwork contract was awarded, it seemed advantageous to subcontract at least part of the first stage earthwork. A subcontract was let to Martin Green, covering 3,278,000 cubic yards of the total figure. Green moved in with two 3½-cubic-yard Lima shovels and a fleet of 14 bottom-dump Euclid hauling units.

The main borrow area at that time, particularly for random material which lies outside the center impervious clay core, lay upstream in the reservoir area, with an easy

(*Continued on next page*)

A pair of Caterpillar DW20's, carrying random fill material for the dam, roar down a 10 per cent grade on the haul road. This 1.3-mile road was down grade.

Riprap finishing is handled by a Koehring 304 dragline. A Euclid end-dump unit unloads stone on the slope. Riprap is used for slope protection on both the upstream and downstream faces of the dam.

Moving Dirt For Lucky Peak Dam

(Continued from preceding page)

elevation differential separating the digging from disposal locations. Conditions underfoot were often wet and it was only by diligent work that Green succeeded in placing the first stage earthwork, which he finished in October, 1951.

From then until July, 1952, the earthwork was shut down because of construction on the outlet tower and second stage stream diversion which occupied the greater part of the fill area. When the main body of earthwork was ready for resumption in July, 1952, the joint-venture contractors took over Green's operations and began to set up the program which today is going full blast.

A fleet of 19 Caterpillar DW20's, property of Bunting Tractor Co., Inc., is hauling 16 bank yards. Because of shovel loading, they are sometimes hauling slightly more material. There is also one 17-yard Euclid bottom-dump machine and 11 Euclid end-dump rigs. Loading equipment includes a Northwest 80-D dragline, a Northwest 80-D power shovel, three 54-B Bucyrus-Erie shovels, and a Koehring 304 which is used on riprap placing.

Auxiliary earthfill equipment includes a pair of Southwest 50-ton rubber - tired pneumatic rollers, pulled by D8's, a D8 dozer and scarifier unit, and a pair of 5,000-gallon Euclid-drawn water tank trucks. One Caterpillar No. 12 motor grader working two shifts is assigned to the project for haul road maintenance and borrow area upkeep.

Earthfill Operation

The earthfill is a high speed operation. Impervious zone material is loaded out by a 2½-yard Esco bucket on the Northwest 80-D dragline. Using the larger torque-converter-equipped Euclid end-dump machines for hauling units, the dragline is working from the pit surface and reaching down to bail the material out at high speed. The average one-way haul for this material is 1¼ miles. Trucks come to the dam, back up, dump their loads, and quickly get away as the D8 dozer moves in to spread the material in lifts not exceeding 12 inches. If water is necessary, it is added by one of two 5,000-gallon trucks, which haul from stand pipes supplied by pumps and pipelines from the river below.

One of the major excavation operations involves the importing of random zone material from a borrow area on top of the mountain overlooking the left abutment. The material is a well-graded granular deposit ranging from sand to large 6-inch cobbles. The formation is tight and firm, and poses possibly the toughest digging assignment there is on Lucky Peak Dam.

Two Bucyrus-Erie 54-B shovels have been assigned to work this upper borrow pit. A third 54-B has been spotted down in the reservoir borrow area where Green produced the original material. Caterpillar DW20's, assigned under these power shovels, are moved in so that there is one unit waiting slightly behind each load that goes out.

Production of random fill is also

General view of the fill showing hauling, grading, and compacting equipment at work.

a problem so far as dipper upkeep is concerned. It is almost a certainty that the teeth will wear down after 16 hours of digging. When operations were on a 16-hour basis daily, the dipper teeth had to be resurfaced every night. Now that work is on a single shift basis, the teeth are taken off and resurfaced with Abrasoweld or Bergstrom C rod every two days.

Aside from dipper wear, there has been little maintenance or upkeep necessary. The power shovels set up against an 11-foot bank and bail out pass after pass. They swing less than 90 degrees, if possible, to load the hauling units. The borrow pit, which started at the very top of the mountain with extremely steep grades, has now been benched down similar to the bermed-down terraces in an open-cut ore mine, so that after the dam is finished, there will be no danger to visitors who might hike over the area.

Steep Haul Roads

The 54-B and DW20 combination is accounting for some good production. Random zone material is 1.3 miles from the point of placement on the dam, all downgrade. At least 90 per cent of the upgrading haul road is on a steep grade, often as high as 16 per cent. Despite these conditions, operators climbed in as fast a gear as possible without lugging the engines, and generally dropped downhill in high or second.

Construction of the Lucky Peak

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TEXACO

Compacting the fill—a Southwest 50-ton rubber-tire roller, towed by a Caterpillar D8, is about to pass another D8 pulling a scarifier.

haul roads was quite a project in itself. Knowing that excessively heavy loads would use the thoroughfares, project officials made the necessary attempt to develop full subgrade bearing value through excellent compaction. Lifts were never put in more than 12 inches thick, and they were rolled heavily by 50-ton compactors. The roads were also rolled by the passage of heavily loaded earth-moving equipment, bringing material into the haul road locations. Where haul roads were in cut zones, they were also rolled after grade had been reached.

In spite of a light coat of gravel surfacing and daily blading by motor graders, the haul roads on steep locations are vulnerable to rain. This was such a factor during March that only about 17 days of effective work could be done.

The random material is being dumped in the same manner as impervious clay. After being spread it is rolled by a Southwest compactor. The intent of the specifications is to develop densities of 95 per cent in all zones, standard proctor. This goal is being reached.

Just prior to placing the dam fills, a considerable amount of abutment cleanup was necessary, particularly in the river channel area, where the water had been diverted for a time. Much of this bottom material was bailed out by a dragline and end-dump Euclids, with wagon drills and compressors also working with the shovel assigned to the abutment higher up to strip fractured rock down to a solid formation.

Riprap Protection

As the random and impervious zones rise, riprap protection is placed on both sloping dam faces. Specifications call for coarse quarry run stone to a 2-foot depth on the upstream face, and finer rock to a 3-foot depth on the downstream face.

Good sources for this material are available with a 2½-mile haul. The Boise River runs through a deep canyon, cut through a lava ridge, with many lava talus slides coming down from the steep escarpment toward the river. Pioneer roads were built into several of the locations where acceptable material could be found. One of the Northwest 80-D shovels and a Euclid end-dump unit were assigned to move the material.

The rock is loose, black, and weathered. Very little bail pull is necessary to break it loose, since it lies in large, gravity-fed piles. The end-dump Euclids deliver the material to the crest of the dam, and then back up to the edge of the fill. At this point, a Caterpillar D6 with a lowering cable slacks each loaded truck down directly to the point of dump. Rough spots left over from the truck dumps are smoothed out by a Koehring 304 dragline. Working from the edge of the fill, the Koehring operator drops a dragline bucket to a point where the teeth comb the dumped rock. Holding the bucket with his load line, he skims the material to a perfect surface.

Equipment Upkeep

Equipment upkeep is good. A small force of six company mechanics takes care of lubrication, service, repair, and fueling of all units during the swing shift. In addition, two mechanical experts from the Boise Caterpillar firm that owns the DW20's are on the project full time, making certain the units are in constant operating condition. One of their principal headaches is the steep downgrade from the top of the hill, which is hard on brakes, brake drums, pistons, and rings—particularly if downhill hauling speeds are too high under engine compression.

Some of the rigs lasted over 1,000 hours under these conditions before brake bands were replaced. Special attention is paid to engine rpm's under load on downgrades on all hauling units. Mechanics are not talking idly when they warn operators to hold engine rpm's down if they want to avoid broken rings, burned valves, and cracked pistons.

There is a central mechanical yard and shop on the project, in which chain hoists, welding equipment, heavy-duty tools, and spare parts are kept. Major repairs on the DW20's have been done in the Boise shop of Caterpillar's distributor.

Equipment operation and service is tied closely to safety. There has not been a single lost-time accident

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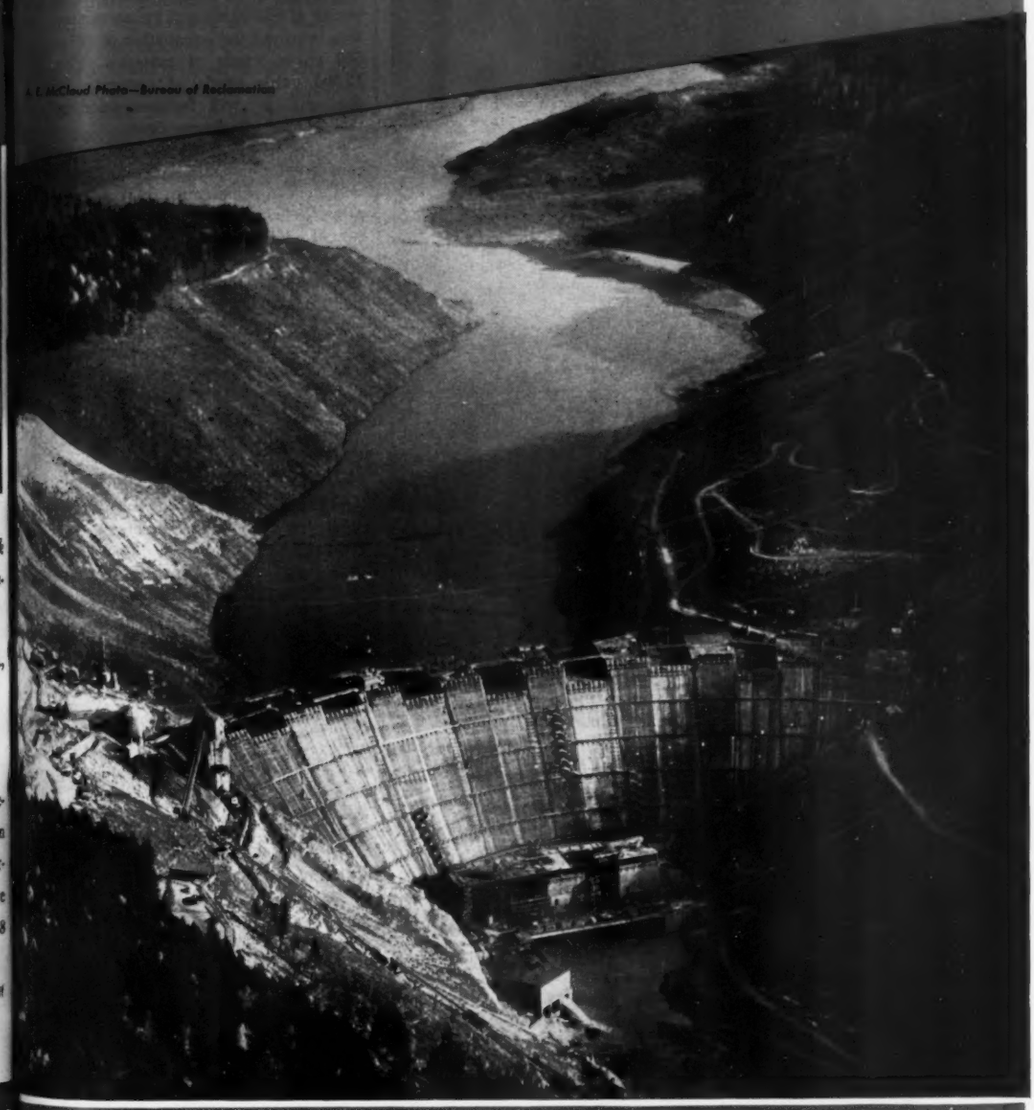
HUNGRY HORSE DAM

J. E. McCloud Photo—Bureau of Reclamation



Lubricants and Fuels
FOR ALL CONTRACTORS' EQUIPMENT

Lucky Peak Dam

(*Continued from preceding page*)

since early last fall, even though full production continued during the winter and spring. Every haul road on the job was built wide enough so that two machines could pass anywhere in an emergency. Some haul roads, obviously intended for special locations, are signed for one-way travel. There is one dangerous intersection on a mountainside, but every safety meeting has stressed its danger. As a result, there have been no accidents at that point. The unwritten rule is that heavy hauling units have the right-of-way over automobile traffic. At present, the fill is pouring in at the rate of 10,000 cubic yards every eight hours.

Dam Rounds Out System

Lucky Peak Dam will round out a major system of reservoirs which now have the Boise River under far better control than ever before. Authorized in 1946 by the second session of the 79th Congress, Lucky Peak will become the third major dam on the stream. The other two, Arrowrock and Anderson Ranch, were built by the Bureau of Reclamation. A joint operational plan is being worked out by the Corps of Engineers and the Bureau of Reclamation, in coordination with the Boise River Board of Control and the Boise River Watermaster for the reservoirs. Coordinated operation of the three reservoirs will provide as much as 983,000 acre-feet of flood control space.

All reservoirs will be refilled by the end of the flood season, thus insuring plenty of water for summer irrigation. In this manner, Lucky Peak, with its multiple purpose features, will provide more complete protection for the Boise River Valley and aid in further development of this prosperous agricultural area.

The Boise River valley floor varies in width from two to six miles. Bordering the valley floor on both sides are bench lands, which extend to the foothills. The 60-foot-long valley has a population of approximately 100,000 persons. These people are largely dependent on the agricultural production of about 340,000 acres of land irrigated by the Boise River.

In its lower 60 miles, the river is characterized by meandering channels, shifting gravel bars, low and eroding banks, and generally inadequate channel capacity. Damaging floods frequently occur due to melting snow. The potential flood plain varies from one to three miles in width, and includes 56,000 acres of highly productive agricultural lands, and 1,780 acres of urban and suburban areas.

The design of Lucky Peak has been influenced in part by the fact that it is the lower unit of the three-dam system. The spillway is of the uncontrolled type, with an unlined channel. The length of its crest is 600 feet, and its ogee elevation is 3,060 feet above sea level. The spillway is designed for a discharge capacity of 93,300 cfs and its construction required the excavation of 247,500 cubic yards of material. The 12,400 cubic yards of concrete in the spillway will fashion training walls and a discharge ogee.

So far as the outlet structure is concerned, plans stipulate that there will be a permanent tunnel to bypass the river waters. A diversion tunnel, with a bore 30 feet in diameter and inlet and outlet channels, was driven through a hill for 1,365 feet. The walls of the tunnel were of highly altered basalt, which air slacked badly. Reinforcement was necessary to prevent sloughing. Th tunnel was lined with a steel shell of 23-foot-inside-diameter, and was backfilled to basalt rock with concrete. This tunnel, used for river diversion during part of the construction period, will form a part of the permanent outlet structure.

The outlet works has a 17,000-cfs capacity at minimum pool elevation, and 30,000-cfs capacity at normal pool elevation. It has a flood-bucket type of energy dissipator, designed for 30,000-cfs. There are six slide gates for river regulation, each measuring 5¼ x 10 feet.

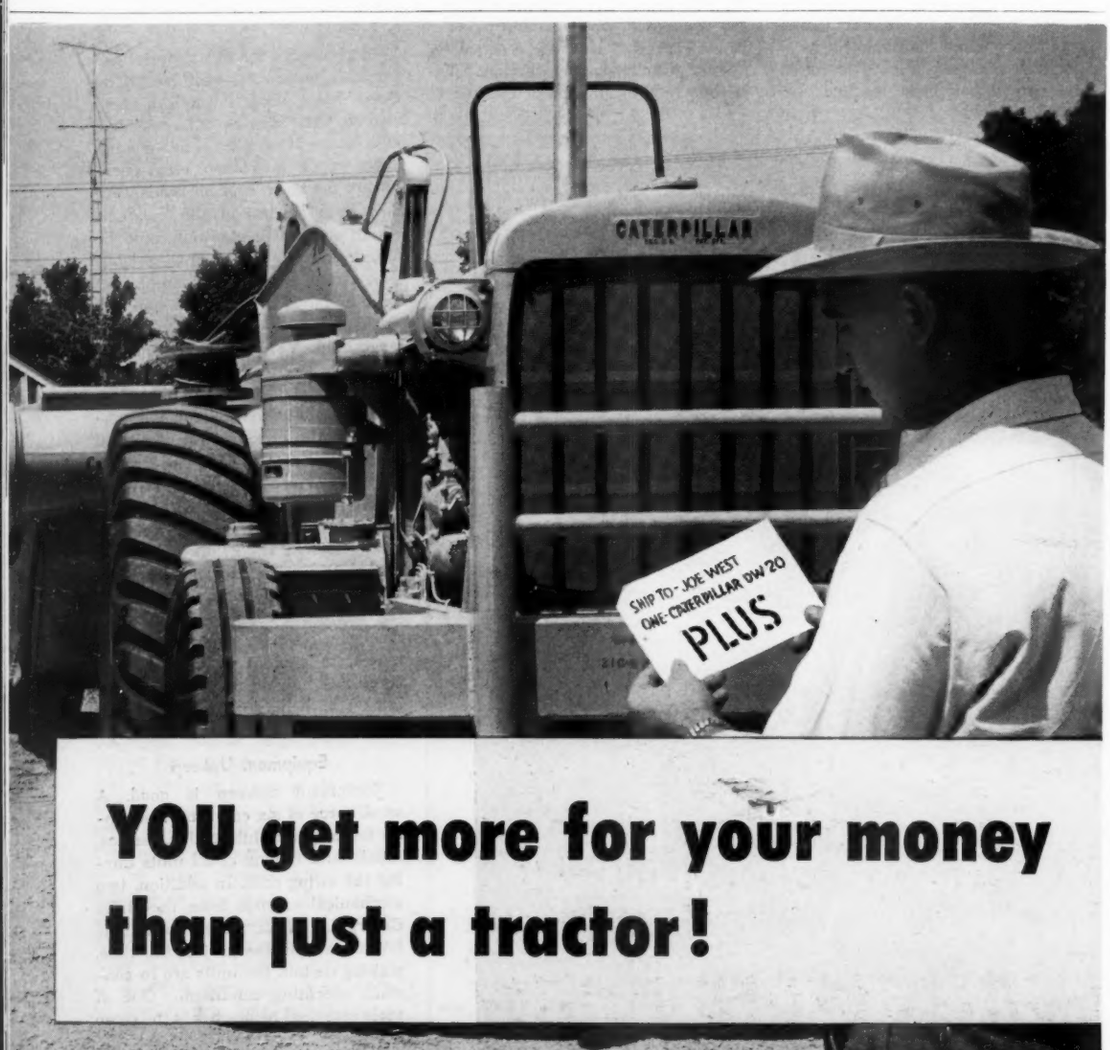
Lucky Peak Reservoir will contain a usable storage totalling 280,000 acre feet. Normal pool elevation will be 3,060 feet above sea level. Minimum pool elevation will be 2,905. Maximum height of the pool will be 3,072 feet. To make room for the reservoir, it was necessary to relocate 21.3 miles of highway.

No provision has been made for the generation of hydroelectric power. The dam is so designed that turbines can be installed in the outlet works if future conditions make this necessary.

Personnel

Lucky Peak's construction is under the general supervision of the Walla Walla, Wash., District of the Corps of Engineers, U. S. Army. Col. F. S. Tandy is district engineer. Walter Murphy is the project engineer for the field.

Contractor's field work is under



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Perhaps one of the most important phases of the arctic test program dealt with engine-starting under low temperature conditions. Four engine generator sets and two Caterpillar D7 tractors, each with different systems of winterization, were involved in the tests.

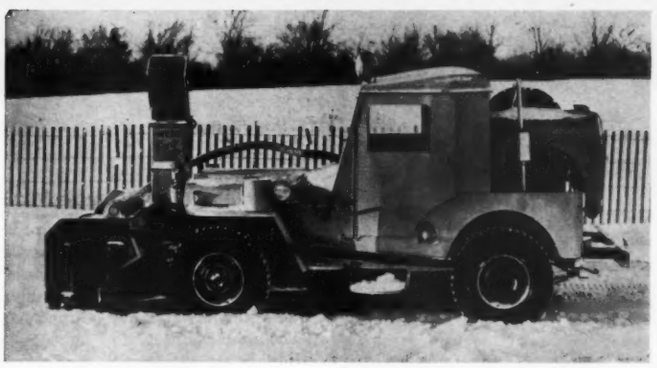
Investigations were also made at the desert station to determine whether winterized equipment required reprocessing or the removal of winterization kit components before it could be used in hot and dry areas. Test results showed processing could be done easily by field units.

The problem of dust raised by wind or vehicles and its effect on mechanized equipment was another phase of the desert tests. Since neither of these dust-raising sources could be controlled adequately, a dust generator was constructed, capable of moving more than 40,000 feet of air per minute at a rate of 45 mph. The unit, a trailer-mounted 42-inch axial-flow fan, generates an almost uniform dust atmosphere in which stationary and mobile units can be tested. Additional tests are currently being made under the Corps of Engineers' broadened high-temperature testing program. Air conditioners, a trailer-mounted lubricator, surveying instruments, packaging equipment, and roadway construction equipment are among the items tested at Arizona station.

At the arctic station, U. S. and Canadian Army engineers worked together to build a test road, using a variety of methods in cross-section construction. Performance records for the road are being maintained to determine the most effective building method. Road equipment was also tested under very low temperatures. Marking paints, protective coatings, screens, base plastics, a water purification unit, and an ice-fog eliminator were subjected to sub-zero temperatures.

(*Continued from preceding page*)

the general supervision of Owen J. Daly, project manager, assisted by Bill Denten, day superintendent. Other key men include Jack Linn, master mechanic; Walter F. Travis, engineer; Frank Morrison, office manager; Kenneth Swan, fill foreman; Peter Kahles, safety engineer; Chick Uriona, riprap foreman; and Ted Cochell, electrician. THE END



The new Brede snow plow attachment for the Willys Jeep.

Rotary Snowplow Fits Small Vehicle

■ A new plow attachment for the Willys Jeep will throw snow 40 to 70 feet off the road. The plow, made by Brede Products, Inc., 1720 New Brighton Blvd., Minneapolis 13, Minn., is said to operate effectively in deep snow at speeds up to 20 mph.

The unit is removable from the jeep and has its own auxiliary 72-hp engine, although its operation is controlled from the driver's seat. A special converter is available that enables the plow to pile up snow at the curb in urban streets.

For further information write to the company, or use the Request Card at page 18. Circle No. 254.

How to Choose Wire Rope

■ A guide for selecting wire rope is offered by the Bergen Wire Rope Co., Lodi, N. J. The data sheet lists the various service conditions affecting wire rope.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 260.

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Contractors Know–It Earns!

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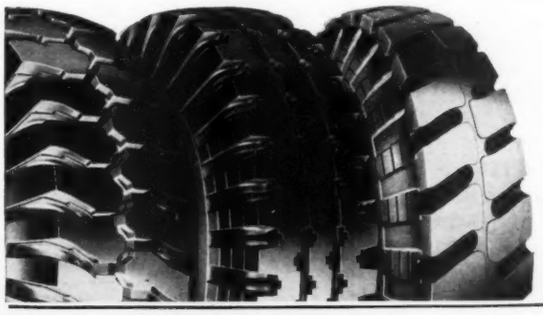

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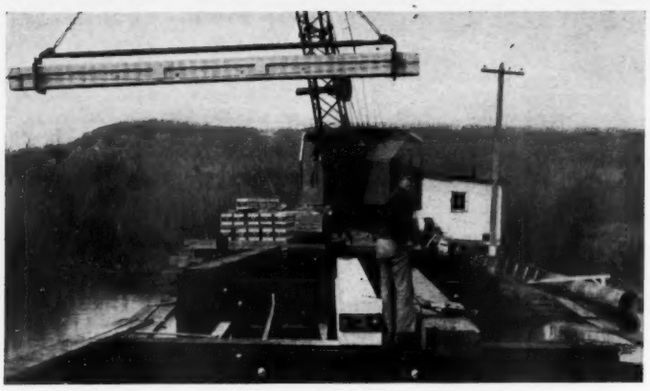
Precast Block Beam



A ¾-yard crane lifts precast beam with aid of an adjustable bridle and supporting hooks. Holes in the beam are for transverse prestressing cables.

PRECAST, PRESTRESSED concrete block beams were used for possibly the first time in Minnesota earlier this year in a bridge crossing Lake Pepin at Lake City, Minn. The span connects the Lake Pepin Boy Scout camp with the nearby highway.

"We Build" is the motto of the Kiwanis clubs. Four southeastern Minnesota clubs proved their belief in the motto by getting together to plan and finance the construction of the bridge. They were helped by the L. M. Feller Co., Rochester, Minn., which did the job on a non-profit, no-equipment-rental, no-overhead basis.

The camp site is on a high piece of ground overlooking the lake and is surrounded on three sides by low ground which is usually wet and sometimes inundated to depths of several feet. At high-water stages, the camp site is an island connected to the mainland only by a narrow road built on a fill about 10 feet high. This fill connects the camp with high ground and with the highway about a quarter of a mile to the west.

The bridge spans a gap in this road fill section which represents the overflow channel of a nearby creek. In heavy rains, the normal creek channel is unable to carry the entire flow and a considerable volume of water flows through this overflow channel. An old truss span carried the access road over this gap for many years but was washed out in a flash flood in 1949.

Gravel fill was tried as a substitute for the bridge, but, in spite of equalizer culverts, this fill washed out twice in flash floods in succeeding years. For more than three years the road has been out of service most of the time.

Twenty Precast Beams

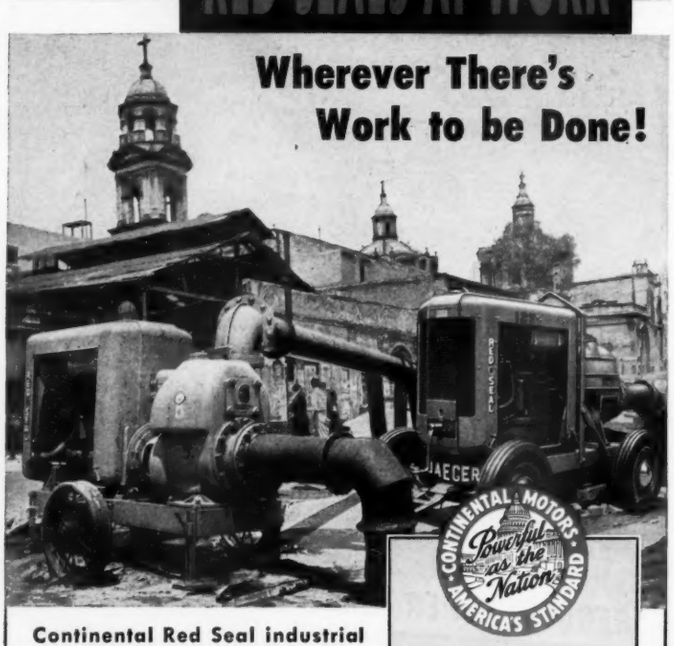
The new structure consists of two treated-pile and timber abutments and a center pier with 20 precast, prestressed, block beams making up the deck. A thin topping of concrete is poured over the beams, with the external faces being formed in the same pour. Timber guardrails supported on concrete building blocks complete the deck.

The two spans are each 25 feet in length, the over-all width of the deck being 14 feet 3 inches. The adjoining road is single-lane, and it was felt that it was unnnecessary to provide a bridge of any greater width than the roadway. The deck has a 1-inch transverse crown and ample space under the guardrails for the escape of snow and rain. It is designed for H-20 loading.

The precast, prestressed, block beams, still a novelty in most parts of the country, were designed by Brian & Dozier, Nashville, Tenn., and built by Northern States Prestressed Concrete Co., Minneapolis, Minn. Each beam consists of a series of blocks manufactured in special molds in a Stearns No. 15 block machine using pea gravel and sand aggregates and a very dry mix. Compression tests of the cured blocks show the strength to be well in excess of 4,000 psi.

Blocks throughout the length of the beam are similar, except for special end blocks and special blocks used at the third points to depress the cables. The typical block is shaped like a heavy-stemmed in-

You Find RED SEALS AT WORK



Continental Red Seal industrial power is getting the call for more and more of the world's tough jobs. Here are two Red Seal M-330's driving pumps on a project where they had to operate almost continuously for a period of several weeks. In-built stamina—fine result of more than 50 years' experience in engineering and precision manufacture—has made Red Seals first choice for assignments where the power plant really has to take it—where work is tough and rest periods few and far between.

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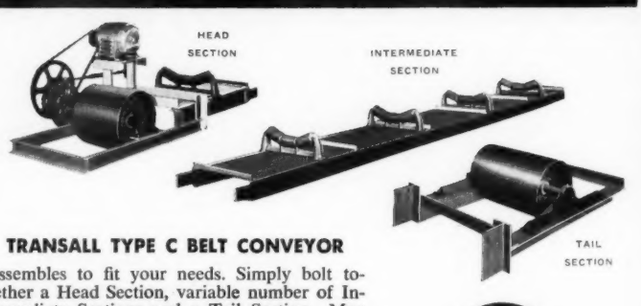

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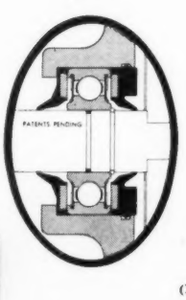
As illustrated at right, improved Tran-Seal Idler bearing assembly is protected by 4 lubrication seals. For details, write TRANSALL, INC., 119 N. 11th Street, Birmingham, Alabama.



TRANSALL SECTIONAL BELT CONVEYOR SYSTEMS

(119-N)

sed for Bridge Deck

verted T, 16 inches wide, 16 inches high, and eight inches thick. Stems are narrower than the base to provide room along each side for the prestressing cables. Stems are also hollow to reduce their weight.

Solid end blocks are used with the cable going through two holes in the block on the tensioning end and passing around the block in a prepared channel at the other end. Specially constructed blocks depress the tensioning cables to a position near the bottom of the beam at the third points of the span.

One Cable for Each Beam

Beams are assembled on a soffit, each block being buttered with ¼ inch of mortar to provide complete uniform contact of the surfaces. One strand of ⅝-inch Roebling cable is then passed completely around the beam and both ends are threaded through the holes in the block at the tensioning end. A hydraulic jack stresses the cables to 160,000 psi to take the creep out of the steel, after which the tension is reduced to leave a stress of 140,000 psi. Roebling end connectors bear against a steel plate to anchor the strands.

Northern States assembled and prestressed the beams at their yard in Minneapolis. A Hydrocrane loaded the 20 beams on three International 3-ton trucks with semi-trailers for the 80-mile haul to Lake City. At the job, Feller's Northwest crane unloaded them and placed the beams on the timber substructures. Drift pins, spaced between the beams and drilled into the pile caps, attach the deck solidly to the piers.

Spaces between the stems of the beams were then filled with concrete, completely encasing the steel cables. A concrete topping over the beams is three inches thick at the center and two inches at the sides, providing a 1-inch crown. Forms for exterior faces of the outside beams were suspended from the deck and the concrete was poured monolithic with the topping.

Transverse prestressing is accomplished by cables threaded through holes in the beams. Tensioning of transverse cables is done with a hydraulic jack after the beams are placed and the topping poured.

Pier and Abutments

Feller drove the treated timber piles for substructures with a Northwest crane using a 2,000-pound Vulcan drop hammer. Abutment piles varied from 20 to 30 feet in length and were driven to five to eight tons bearing. Forty-foot piles were used for the pier and were driven to at least ten tons bearing. The abutments each contain eight piles and two deadmen for tieback. These piles are backed up with 3-inch creosoted timber and backfilled with gravel dredged by dragline from a nearby bar. A 12 x 12 cap over four of the piles provides the bearing for the beams.

The center pier consists of three piles braced with 3 x 8 creosoted planks and capped with a 14 x 12 treated timber held in place with drift pins.

Feller used a Lombard gasoline-powered chain saw to cut off the piles and drilled holes for bolts and drift pins with a Black & Decker drill taking its power from a Jackson portable generator.

Workmen prepare to string transverse prestressing cables through holes in beams before the concrete topping is poured.

Completion of the structure marked the first time in three years that the camp has been assured of an all-weather entrance at all stages of the lake. The Kiwanis clubs in Winona, Red Wing, Rochester, and Spring Valley, Minn., feel they have done their good turn. THE END

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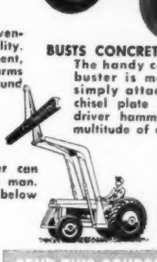

BUSTS CONCRETE, ETC.
The handy concrete buster is made by simply attaching a chisel plate to post driver hammer. Has multitude of uses.

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Leaves, snow, dirt, and trash are easily cleared and loaded with either material or utility bucket.

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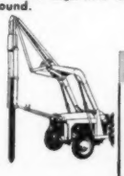

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New Plant For Dart

The Dart Mfg. & Sales Co., manufacturer of concrete vibration equipment, has moved into new quarters at 1002 South Jason, Denver, Colo. The new plant is located on 2½ acres of ground in a highly industrialized district providing ample room for expansion.

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Scotty "Caveman" McBlock says, "Nae' more strain and fuss—th' McKissick way is th' easy way."
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View of the Houston Ship Channel showing the location of the new multi-million dollar Baytown-La Porte tunnel.

Underwater Tunnel Is Largest in Texas

TEXAS' NEW multi-million dollar tunnel between Baytown and La Porte, one of the world's largest subaqueous tubes, was opened September 22. The $10,013,149 tunnel, which passes under the Houston Ship Channel, is the longest underwater tunnel in Texas. It was constructed by Brown & Root, Inc., and Farnsworth & Chambers Co., Inc., both of Houston, Texas. Brown & Root held the contract for the tube proper while Farnsworth & Chambers did the finishing. Both firms shared the contract for constructing the approach roads.

The Texas Highway Department absorbed $4,055,649 of the cost, while $3,057,500 came from Federal aid and $2,900,000 from Harris County.

The tunnel proper is 3,009 feet in length from portal to portal and has 551-foot open approaches at each end. The over-all length of the project, including approaches, is seven miles. A unique feature of the construction is a three-level traffic exchange on the La Porte side. This is the only exchange of its type in Texas and one of the few in the world.

Measurements

The roadway through the tunnel measures 22 feet from curb to curb, with a minimum vertical clearance of 14 feet at the curb line. The exit lanes widen from 11 to 23 feet beyond the portals to provide a

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Blade angle carries dirt or gravel upward toward roadway. Eliminates the usual cost of removing excess dirt from ditches. Supplies material for finishing operation.

On or off most motor-graders in 20 min. Blade raises over drive-ways and culverts —folds close to machine for traveling.

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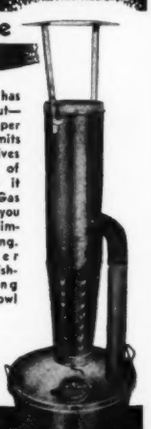

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Entrance on the Baytown side of the Baytown-La Porte tunnel. The building is the six-story control tower.

second line of traffic for slow-moving vehicles.

The ½-inch steel tunnel tube is 35 feet in diameter and acts as a form for the three feet of concrete which is the tunnel proper. The steel tube sections were fabricated at Orange, Texas, towed to the site, sunk into place in a dredged trench, and then finished. Six of the nine tube sections are 300 feet long and the three center sections, each having been constructed to fit the alignment curve, are 252 feet in length. The bottom of the tunnel is 89 feet below water at mean tide.

The sections were sunk end to end, bolted together, and made watertight with a special type of concrete. The empty structural steel in the tubes weighs 4,500 tons. More than 52,270 cubic yards of concrete was used. There were 1⅓ million tiles.

Control Building

A six-story building housing the controls is located on the Baytown side. Three of the stories are below ground and three above, the latter housing the ventilation, pumping system, and other operating devices. Giant blowers force air through the tunnel, providing proper ventilation. They are capable of completely changing the air every two minutes. A carbon monoxide detector in the tube warns the control tower if the air becomes impure.

The Texas Highway Department maintains an auto wrecker in the event of accidents. A scrubbing truck for cleaning the tube is also maintained by the department.

The tunnel, which took almost four years to complete, will replace the Morgan's Point ferry at this crossing, which was first opened in 1933. The ferry, which was operated by the highway department, carried 18 cars per trip and operated 16 hours a day.

The firm of Parsons, Brinckerhoff, Hall & MacDonald designed the tunnel and supervised its construction with engineers W. H. Bruce and Ray Lyons in charge of the project.

THE END

Concrete Plasticizer

■ The use of a concrete plasticizer in concrete-block production is described in literature from the Spray-O-Bond Co., 2225 N. Humboldt Ave., Milwaukee 12, Wis. According to the booklet, block plants that have used this material have experienced less breakage in the handling of the green units as they come off the machine. Blocks made with the plasticizer are also said to cure faster, absorb less moisture, and have a better face texture.

When added to portland cement-aggregate-mix in the presence of water, the concrete plasticizer reacts with the cement helping to disperse the small particles of cement throughout the mass. The cement is said to coat each aggregate particle more thoroughly under these conditions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 275.

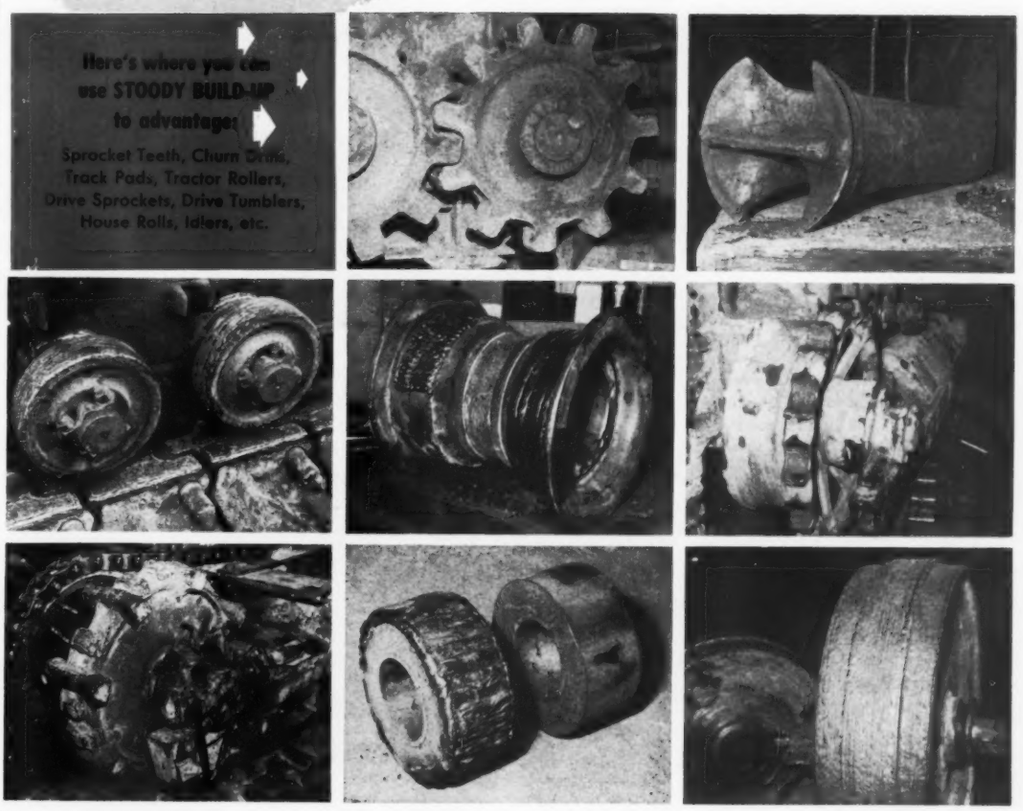
Sewer-Pipe Compound

■ A bituminous sewer-pipe joint compound is discussed in literature from the Asphaltic Specialties Co., Inc., Plainfield, N. J. The literature states that when the compound, Thermoseal, is used at the recommended temperature and is carefully poured, it will penetrate the pores of the unglazed portion of the bell and spigot. The resulting leak-proof joint is said to withstand more than 40 psi internal pressure and to have a resistance to tensile stress over 150 psi.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 223.

AT LAST! A real build-up material that has what it takes!

STOODY BUILD-UP


Here's where you can use STOODY BUILD-UP to advantage:
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USED TO BE that anything you could weld with was considered good enough for a build-up—high carbon, mild steel or what have you.

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STOODY BUILD-UP is for use on carbon and low alloy steels preliminary to hard-facing. For some uses it is recommended as a final overlay—steel shafts that require a machine finish, gears of many types, tractor rails and shovel pads. These and other typical applications are illustrated above.

See your Stoody dealer or write for special folder describing Stoody Build-Up. (Consult the "yellow pages" of your phone book.)

STOODY COMPANY

11936 EAST SLAUSON AVENUE, WHITTIER, CALIFORNIA

Mobile Lighting Plant

■ A new model has been added to the line of lighting plants sold by the Katolight Corp., 624 N. Front St., Mankato, Minn. The new unit consists of a 5-kw ac generator that supplies 60-cycle current at standard voltages of 110 to 220 or 220 to 440 at 1,800 rpm. The single or 3 phase generator is of the revolving-field-type with separate exciter attached. It is available with or without automatic voltage regulator.

The generator is powered with a 2-cylinder, 4-cycle-type, air-cooled engine. It is available with or without standard 6-volt automatic starting. The entire unit is mounted on wheels with retractable handles. It can be equipped for hand wheeling or for trailer towing.

For further information write to the company, or use the Request Card at page 18. Circle No. 172.

Track-Mounted Excavator

■ Their recently announced ⅜-yard, 5-ton crawler-mounted excavator is illustrated in literature from the Schield Bantam Co., Waverly, Iowa. Features of the Model C-35 Bantam described in the booklet include two-speed independent travel that enables the operator to work a front-end attachment while traveling and swinging the machine.

The unit travels on 16-inch pads. With an over-all width of 94 inches, it meets highway transportation requirements without special road permits. Gross weight is 15,522 pounds including the 1,400-pound counterweight but not the front-end attachment. A wide range of attachments available for the crawler-mounted excavator can also be used on the company's T-35 truck-mounted machine.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 229.

Drawing-Pen Cleaner

■ The Higgins pen cleaner for removing dried waterproofed ink now comes in a special jar that makes cleaning easier. The new straight-sided 6-ounce jar is equipped with a strainer on which small items such as Wrico & LeRoy pen parts, air brush parts, Speedball pens, and drafting instruments may be placed and immersed in the cleaner. A projecting rod on the strainer makes it possible to retrieve these small parts without fishing after them.

For further information write to the Higgins Ink Co., 271 Ninth St., Brooklyn 15, N. Y., or use the Request Card that is bound in at page 18. Circle No. 284.

Tilt-Top Trailers

■ Two new tilt-top trailers have been added to the line made by Transport Trailers, Inc., P. O. Box 968, Cedar Rapids, Iowa. The tow-type trailers have tandem axles with single wheels in line.

Model T-8-14 has a 14-foot platform length and an 8 to 10-ton capacity. Model T-8-18 has the same capacity and an 18-foot platform length. Both units have a 76½-inch inside-platform width.

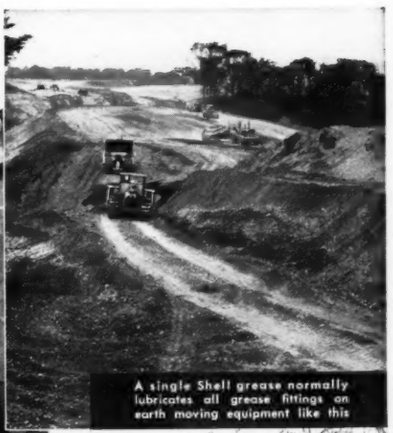
The trailers have automatic safety locks to secure the platform when loaded or empty, an A-frame-type drawbar with safety chains, an adjustable support for parking the trailer, 4 lashing rings, and a welded-steel frame with oak flooring.

For further information write to the company, or use the Request Card at page 18. Circle No. 177.

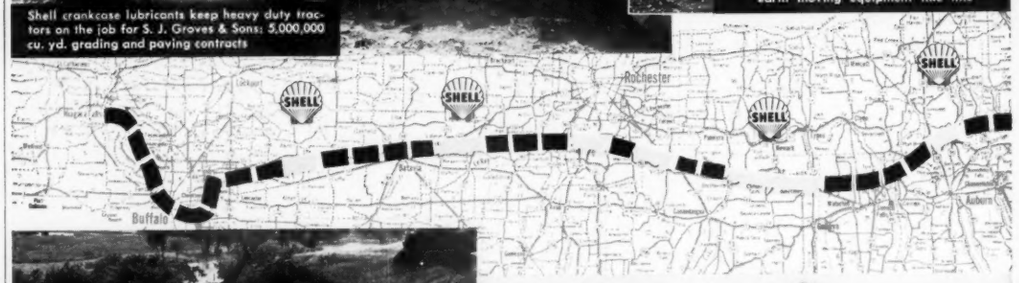
One of the two new Transport Trailers tilt-top units.

On the New York State Thruway

Shell crankcase lubricants keep heavy duty tractors on the job for S. J. Groves & Sons: 5,000,000 cu. yd. grading and paving contracts



A single Shell grease normally lubricates all grease fittings on earth moving equipment like this



Severe operation causes no motor problem with Shell Heavy Duty oil in the crankcase

Shell E. P. Gear Lubricant takes the punishment during rough going on steep grades

Arute Bros., Inc. depend upon the "stay-put" qualities of Shell's Multi-Purpose Grease for continuous heavy duty work

Ice-Control Unit Is Hydraulically Operated

■ An improved line of truck-type spreaders for ice control is announced by the Baughman Mfg. Co., Shipley Road, Jerseyville, Ill. The distributor on Spreadmobile units is located half-way between the front and rear wheels so that it spreads sand, cinders, and calcium chloride under all four wheels.

With completely hydraulic operation, the driver can accurately control both the width and the amount of spread of the skid-proofing material. Starting, stopping, distributor, and drag-chain controls are located in the cab. The spread mechanism is powered by a 14-hp Wisconsin gas engine.

The load is kept from freezing by means of a chamber that runs the length of the truck body and connects to the motor exhaust. This warming process also helps the material to penetrate road ice.

A split-bottom dump is now standard equipment and permits the truck body to be used for general dumping in off-season periods. By reversing the body so that the distributor is to the rear, the Spreadmobile can also be used for road maintenance work.

For further information write to the company, or use the Request Card at page 18. Circle No. 261.

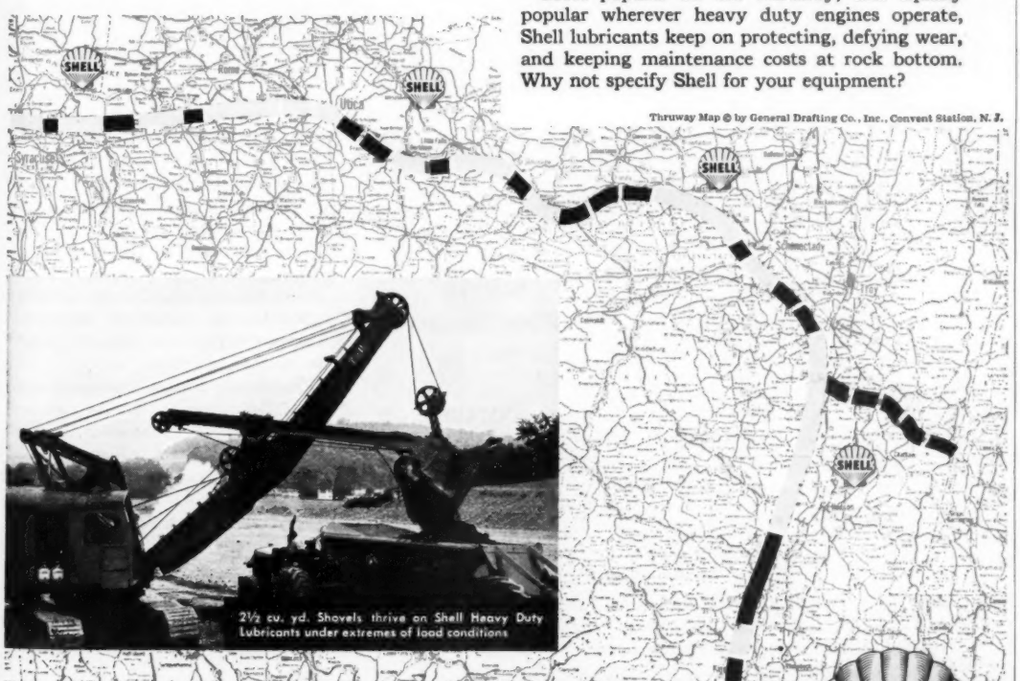
... 1 out of every 3 construction miles uses SHELL PRODUCTS *exclusively*

That's just one way of saying that Shell has been awarded contracts by companies responsible for building sections of the New York State Thruway totaling over one third of the entire mileage. And the contracts are still coming in!

Trucks, shovels, dozers, graders . . . all equipment run by gasoline or diesel engines on those long stretches of highway construction . . . benefit from the outstanding performance of Shell heavy duty lubricants.

Products that can win the unqualified preference of such responsible and efficient operators must have what it takes . . . and Shell products *have* it . . . plenty!

Most popular on the Thruway, and equally popular wherever heavy duty engines operate, Shell lubricants keep on protecting, defying wear, and keeping maintenance costs at rock bottom. Why not specify Shell for your equipment?

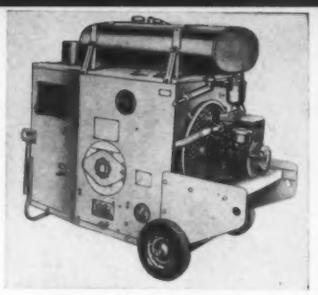


2½ cu. yd. Shovels thrive on Shell Heavy Duty Lubricants under extremes of load conditions

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIF.

SHELL



The gasoline-fired Herman Nelson air heater.

Portable Air Heater

■ A gasoline-fired portable air heater is announced by the American Air Filter Co., Inc., 1824 Third Ave., Moline, Ill. The redesigned standard model Herman Nelson heater is powered by a Briggs & Stratton Model 6 engine.

A new feature is a fuel-metering valve which can reduce the capacity of the unit from a maximum 385,000 Btu to a low 100,000 Btu per hour.

For further information write to the company, or use the Request Card at page 18. Circle No. 217.

Curb and Gutter Forms

■ Steel forms for building concrete curbs, gutters, and sidewalks are discussed in a new booklet from the Heltzel Steel Form & Iron Co., Warren, Ohio. The Heltzel forms are offered with three interchangeable curb faces and three optional curb face form supports. Each complete 10-foot unit of curb and gutter forms consists of one back curb form, one front gutter form, one face curb form, two face curb form supports, two round stakes for the back form, and two round stakes for the gutter form. The literature stresses that the basic set of Helco forms will handle many types of work.

Separate sections discuss dowel-joint curb forms, rigid and flexible radius steel forms, forms for concrete sidewalks, and other special steel forms.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 196.

Office Machine Rental

■ Business machines and office equipment are available on a lease basis through a new plan announced by Remington Rand, Inc., 315 Fourth Ave., New York 10, N. Y. The plan covers such items as typewriters, printing calculators, adding and accounting machines, photocopying units, insulated safes, desks, cabinets, Sched-U-Graph boards for production control, and a full line of visible-record-keeping and filing equipment.

The new lease plan includes a purchase option arrangement under which all or a substantial portion of the amounts paid for rentals may be applied against purchase of the business machines or equipment at regular prices. The option may be exercised at any time during the period of the rental arrangement.

For further information write to the company, or use the Request Card at page 18. Circle No. 259.

Longer than the dock to which it is moored, R. C. Huffman's Number Three dredge undergoes conversion of its pumping equipment to increase its capacity by 30 per cent.

Direct-Diesel Power Used on Dredge Pump

ENGINEERS at the R. C. Huffman Construction Co., St. Petersburg, Fla., are convinced of the practicality of direct-drive diesel power for dredge pumps. A Huffman dredge, using an opposed-piston diesel driving a 16-inch pump through a flexible coupling, pumped to within 20 per cent of the production of another dredge with a 20-inch pump. The latter was being used by another company cooperating with Huffman on the construction of 27 miles of beach, 300 feet wide, along the northern Gulf Coast.

The Huffman pump was driven by a Fairbanks-Morse Model 38D8—⅛ ten-cylinder opposed-piston diesel. The dredge, known as Number Three, was equipped with an 18-inch pump that gave it a 30 per cent greater capacity. Built in Huffman's own shop, the new pump is powered by the same F-M diesel.

With suction at 20-inch vacuum and a discharge pressure of 90 psi, the 16-inch pump could handle more than 12,500 gpm. The diesel is rated at 1,600 hp at 720 rpm, but the limitation of the pump kept regular operating speed at 550 rpm.

The new pump also operates at 550 rpm behind a 5-foot-diameter x 5-foot-pitch cutter suspended from the hydraulically-controlled ladder. The cutter, hemispherically shaped of welded steel, is mounted on a 9-inch-diameter shaft which turns at a minimum 16 rpm and a maximum 27 rpm. It is driven through a gear reducer by a 200-hp variable-speed slip-ring motor.

Operating at a vacuum of 20 inches of mercury at the suction, the new pump will discharge at more than 100 pounds pressure, enabling it to pump 16,000 gpm through 18-inch discharge lines ranging up to a mile in length. It will be direct-driven through a fluid coupling which minimizes the possibility of engine damage in the event that the pump is jammed by debris.

The usual bottom the pump will be called upon to handle consists of sand or silt. The solids content of the pump effluent will run as high as 25 per cent of the mixture. The solids content will run lower when shell dredging. Shell dredging accounts for much of the dredge's work load, since gravel is nonexistent in Florida, and shells are in great demand for road base material.

The Huffman Construction Co. has played an important part in the development of land in the St. Petersburg-Tampa area. As is often the case in Florida, a great deal of otherwise desirable property is at such a low elevation as to be unsuitable for building purposes. With the demand that exists for property fronting on the Gulf of Mexico, Huffman's dredges have been kept

Most of the Cast-in-Place Piles on the New York Thruway are COBI PILES being driven by C. L. Guild Construction Co., Inc.

A paragraph from a story on the New York Thruway in ENGINEERING NEWS-RECORD of July 16, 1953

"A short distance farther, C. L. Guild, of East Providence, R. I., is driving cast-in-place piles with a pneumatic mandrel that expands inside the casing, transmitting driving force to the casing wall by friction (ENR Jan. 11, 1951, p. 35). (Most of the cast-in-place piles for thruway bridges are being driven by this method.) Guild is subcontractor for B. Perini Sons, Framingham, Mass., at this location."

The Cobi Pile is the most prominent cast-in-place pile being used for structures on the New York Thruway. C. L. Guild Construction Co., Inc. are driving more than 550,000 ft. of Cobi Piles.

C. L. GUILD CONSTRUCTION CO., INC.
94 Water Street — *East Providence, R. I.*
DIVISIONS

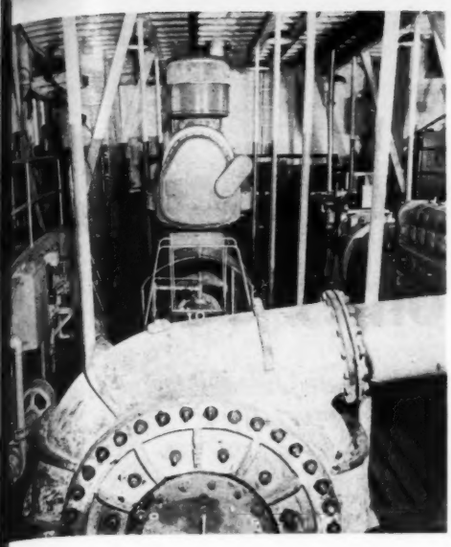
Eastern Concrete Pile Co.
80 Boylston St.
Boston, Mass.

American Drilling Company
92 Water St.
East Providence, R. I.

HERE'S THE RECORD

GENERAL CONTRACTOR	HOME OFFICE	NO. OF CONTRACTS	TOTAL FOOTAGE (ENGINEERS ESTIMATE)
D. W. Winkelman Co. Inc.	Syracuse, N. Y.	5	86,750
The Lane Construction Corp.	Meriden, Ct.	3	153,700
B. Perini & Sons, Inc.	Framingham, Mass.	1	70,050
Bero Eng. & Const. Co.	Buffalo, N. Y.	3	17,018
Potter-Dewitt, Inc.	Pavilion, N. Y.	2	16,361
Dan Bar Contracting Co. & W. E. O'Neil Constr. Co.	Syracuse, N. Y.	3	27,576
L. G. DeFelice & Son, Inc.	North Haven, Ct.	1	64,100
D. V. Frione, Inc.	New Haven, Ct.	1	22,260
Brunalli Construction Co.	Southington, Ct.	1	15,292
H. L. Baughman, Inc.	Rochester, N. Y.	2	22,261
Arute Bros., Inc.	New Britain, Ct.	1	9,895
A. S. Wikstrom, Inc.	Skaneateles, N. Y.	1	8,742
The Savin Constr. Corp.	Hartford, Ct.	1	1,508
Hogeboom & Campfield, Inc.	New Hartford, N. Y.	1	10,200
Grandview Construction Co.	Mount Vernon, N. Y.	1	6,300
Howes & Farrell, Inc.	Oneida, N. Y.	1	11,390
S. A. Scullen, Inc.	Waterford, N. Y.	1	9,000
			552,403

THE COBI PILE IS THE WORLD'S FINEST CAST-IN-PLACE PILE



Engine room shot shows how the compact Fairbanks Morse 1,600-hp opposed-piston engine is dwarfed by the 16-inch pump which it drives.

busy building many artificial peninsulas that line the coast and provide the solid ground necessary for home construction.

Number Three was built by the Ellicott Machine Corp., Baltimore, Md. It is the newest of three F-M-powered barges owned by Huffman and is also the most powerful. The other two, both driving 16-inch pumps, use Model 37D14 F-M diesels. The compact design of Number Three's opposed piston engine was a great aid in providing working space in the engine room. Also housed there are two more diesels which drive 220-volt dc generators to operate the cutter motor and the pumps for the hydraulic system. The hydraulic system controls the ladder which carries the cutter and regulates its depth. The spuds, which move the dredge once it has been towed into position, are also hydraulically controlled.

The workshop area, just forward of the engine room and at deck level, contains a complete set of hand and power tools, making the dredge virtually self-sufficient. To the rear of the engine room are the mess and galley. The pilot house is located on the upper deck and the crew's quarters are behind that.

The pilot house's location above the pump room permits direct control of the hydraulic system, eliminating the signal system generally used. Not only does this save time, but it also eliminates the possibility of a man in the pump room misinterpreting signals. Engine room instructions are relayed by a standard signal system. THE END

Beam Formula Reference

"Beam Formulas", a comprehensive reference from which statical and elastic data for beams can be obtained, is available from the Frederick Ungar Publishing Co., 105 E. 24th St., New York 10, N. Y., for $5.50.

Translated, enlarged, and adapted by Harold G. Lorsch, assistant professor of civil engineering at The City College of New York, the volume is based on the seventh edition of Adolf Kleinlogel's "Belastungsglieder". The original contained only statical data (reactions, shears, moments) and end slopes; the American version also contains equations of the elastic curve (deflections) for all loading conditions.

More than 70 loading conditions, covering the entire range of loads that occur in practical engineering, are shown in the Lorsch translation. It is said to be of invaluable aid even to those with a limited theoretical background.

Masonry Saw Blades

■ A reinforced abrasive blade for use on masonry saws is announced by the Robert G. Evans Co., 6315 Brookside Plaza, Kansas City 13, Mo. The Target safety-blade is said to withstand severe flexing, side pressures, and bumping while in operation. The blade has a strong center core of synthetic fabric.

A variety of blades is available for work on brick, stone, concrete blocks, tile, and refractories. The manufacturer uses a color system to identify different specifications.

For further information write to the company or use the Request Card at page 18. Circle No. 308.

Throwaway Rock Bits

Have been proven:

1. Low in original cost
2. Lower in cost per foot of hole
3. Longer lasting
4. Easy to use
5. Economical for all type Jack Hammers

⅞" Socket in 9 sizes, 1¼" to 1¾"
1" Socket in 9 sizes, 1" to 2¼"

CONVENTIONAL ROCK BITS GIVE WAY TO IMPROVED MODERN DESIGN

Write for prices and full details

THROWAWAY BIT CORPORATION

4200 N. W. Yeon Ave., Portland 10, Ore.

no other grader offers you this

UNBEATABLE COMBINATION

all-wheel drive

wakes up the front wheels

The front end of the ordinary motor grader is lazy, dead weight, contributing nothing to traction.

On the Austin-Western Power Grader, every pound rides on a driving wheel, contributing 100 per cent to traction.

all-wheel steer

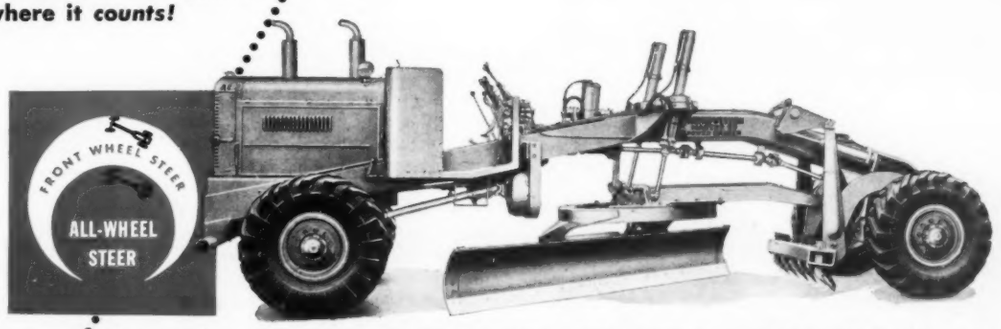
frees the rear wheels

Non-steerable rear wheels slow-down all operations, make them more difficult.

Steerable rear wheels speed up every job, make it easy to do things impossible for other graders.

Twice the maneuverability

30% more POWER at the blade—more power where it *counts!*



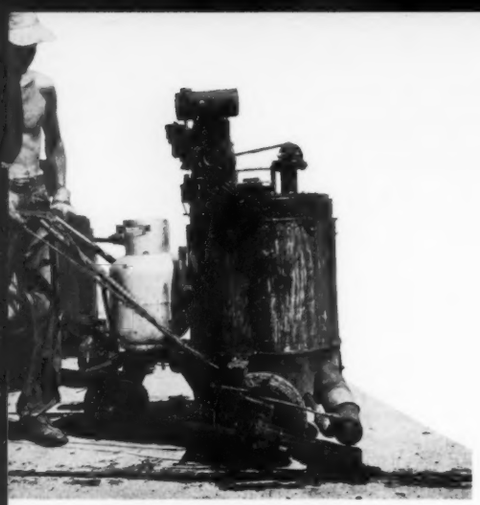
No wonder . . . Austin-Western "88-H," "99-H" and Master "99" Power Graders, with their finger-tip hydraulic control and unequaled stamina, plus exclusive All-Wheel Drive and All-Wheel Steer, outpull, outmaneuver and just naturally outperform all others.

Austin-Western

Power Graders · Motor Sweepers
Road Rollers · Hydraulic Cranes

BALDWIN LIMA HAMILTON BLH Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.



A Hecker applicator seals joints.

C. & E. Photos

A wire brush machine, powered by a Wisconsin engine, removes old material from the joint.

A remodeled garden tractor, equipped with a cutting blade, continues the cleaning operation.

Irregular cracks are cleaned and widened by a Tennant joint-cleaning machine.

Maintenance By Contract:

Rubber-Asphalt Mix Seals Paving Joints

Specialized equipment cleans and fills joints in concrete pavements on Minnesota highways

By RALPH MONSON, Field Editor

SEALING JOINTS AND CRACKS in concrete pavements, often a neglected maintenance operation, is being successfully and economically done under contract on Minnesota's trunk highway system. A total of 1,153 miles of pavement has been sealed with rubber-asphalt joint compound since the first contracts were let in 1950. The 1953 program included 345 miles, and additional work is proposed for 1954.

C. L. Motl, maintenance engineer for the Minnesota Department of Highways, credits the unusually good results obtained by his department to the fact that the work is done by contract under very rigid specifications which are carefully followed. He points out that extreme care must be exercised in cleaning the joints to be certain that all old joint filler and other materials are removed, exposing a clean concrete face to the rubber-asphalt compound.

A number of contractors have indicated their interest in this type of work. As many as six bids have been received at a letting. Work during the 1953 season was done by two contractors. The accompanying pictures show the several steps in the operation as done by C. L. Nelson & Co., Inc., Brainerd, Minn., on highway 15 between New Ulm and Winthrop.

Shop-made Machines

Cleaning out the joints and cracks calls for some special equipment in addition to several factory-made machines. A two-wheel garden tractor, fitted with concrete wheel weights and a scraping blade, gouges out most of the old filler from the transverse joints. Further cleaning is done by a wire-brushing machine made in Nelson's shop. The machine has a spinning drum made of two heavy plates. Short pieces of cable clamped tightly between the plates project about four inches to form the brush. Power is supplied by a Wisconsin engine.

A Ford tractor, equipped with a cutter designed to fit the center joint, cleans the longitudinal joint. All cracks and joints are wire-brushed immediately ahead of the pouring operation with Hecker J. C. Power Brushes. Any remaining dust or loose material is blown from the joints by a jet of air from a Le Roi Tractair compressor.

Irregular cracks must be widened to permit pouring of the filler. For this operation, Nelson uses a Tennant joint-cleaning machine. A

In the final cleaning step, loose materials are blown out of the joints by an air jet from a Le Roi Tractair compressor.

A semitrailer, pulled by a Chevrolet truck, carries the heating kettle and spare gas containers.

Joints are filled by Hecker applicators in two pours to allow for shrinkage of the material as it cools.

series of rotating cutters, attached to the periphery of a rapidly spinning drum, vee out the crack as they remove the old joint material. A Tennant power sweeper, following the cleaning machines, picks up loose materials from the pavement.

Special Heaters Required

Rubber-asphalt joint compound must be placed between 380 and 450 degrees F in order to insure satisfactory results. The compound is extremely difficult to pour at lower temperatures and is easily damaged by overheating. Nelson heats the material in kettles made especially for this purpose in its shop.

The inner compartment of the heating kettle holds 2,500 pounds of compound and contains a power agitator to keep the material constantly in motion. Surrounding this compartment is an oil bath containing a heat transfer oil having a flash point of over 600 degrees F.

Burners using liquid petroleum gas heat the oil bath. Thermostatic controls automatically maintain the temperature of the compound within the required limits. The heater requires very little attention except for feeding in the solid material and drawing out the liquid.

Packages of rubber-asphalt compound are sliced into convenient pieces by a heated blade. When in a vertical position, the blade retracts into a compartment where it is heated by gas jets. Packaged material is placed on the cutting table and the guillotine-like knife slices it into several pieces.

Heater, knife, gas containers, and a supply of the jointing compound are carried on a semitrailer pulled by a Chevrolet truck.

Pouring the Joints

Hecker applicators pick up a supply of the heated compound at the draw-off cock of the heating tank and keep the material constantly heated and agitated until it has been placed. These applicators carry a 20-pound gas container which supplies heat through a transfer oil to the compound to maintain the required temperature. A Briggs & Stratton motor operates an agitator within the inner tank of the applicator.

Because the compound shrinks as it cools, deep joints are poured twice, the final pouring following a considerable distance behind the first. Cracks and very shallow joints are filled in one pour.

One spread, consisting of the described cleaning equipment and four applicators, seals an average of two miles of pavement per ten-hour day, using an average of 6,800 pounds of rubber-asphalt per mile. Nelson used two such spreads on the job visited by CONTRACTORS AND ENGINEERS, which included 110 miles of pavement. Average cost of this type of work in Minnesota has been approximately $2,000 per mile.

Personnel

Superintendent for C. L. Nelson & Co., Inc., was Clifford Fischer. Supervising inspector for the Minnesota Department of Highways was William Breinhorst. C. L. Motl is maintenance engineer for the department, and M. J. Hoffman is commissioner of highways. THE END

High-Heat Lubricant

■ A new heavy-duty lubricant for use where excessive heat is a problem is announced by the D-A Lubricant Co., 1311 W. 29th St., Indianapolis 23, Ind.

The manufacturer recommends the lubricant, D-A Lithium, extra-heavy for shovels which are operating close to their upper limits and for hot-running crushing plants, shaker screens, hot-mix plants, and wheel bearings where moisture and temperatures are very high. The new lubricant comes in 35-pound pails and 100-pound quarter-drums.

For further information write to the company, or use the Request Card at page 18. Circle No. 219.

Highway Truck Tire

■ A new highway truck tire with variable grooves and ribs for increased stability and wear has been announced by the Fisk Division of the United States Rubber Co., Rockefeller Center, New York 20, N. Y. Called the Fisk Transportation, the new tire features an angle-action tread and is said to have over 33,000 biting edges in the larger sizes. The deep grooves in the tread are relatively narrow on the diagonal to give good surface contact, but straight-ahead grooves are wider for strength where there is the greatest strain.

For further information write to the company, or use the Request Card at page 18. Circle No. 198.

For dig-power it's CAT* Engines

WHEN there's Caterpillar power behind the bucket you can look for real production. The shovel or backhoe will be working—not standing idle while somebody tinkers with the engine.

This Caterpillar-powered Bucyrus-Erie 22-B is one of a pair owned by Calandro Construction Co., Scarsdale, N. Y. It's working on a 14,000-yard excavating job for foundations of the new Mamaroneck High School. Whether it's trenching with a 1-yard backhoe or loading trucks with a ¾-yard dipper, the Caterpillar D318 Engine puts out plenty of digging power.

John Calandro, Jr., says: "Both of our Caterpillar-powered shovels as well as our D8 Tractor have given very satisfactory service over the many hours they have been operated."

You get economy as well as dependability when Cat Engines power your equipment. They operate without fouling on No. 2 furnace oil. And they're sturdily built to keep working with a minimum of down time.

Leading manufacturers can supply Caterpillar Engines in the machines they build, with 12 sizes available, up to 500 HP. For replacement power see your Caterpillar Dealer. He backs every product he sells with reliable service and a full stock of genuine parts.

Caterpillar, Peoria, Illinois.

CATERPILLAR*

*Both Cat and Caterpillar are registered trademarks—®

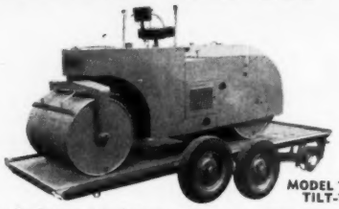
SPECIFY CAT POWER FOR HIGH-PROFIT PRODUCTION

READY TO MOVE . . . IN MINUTES!
WITH A TRANSPORT TILT-TOP

MODEL GXTT
Gooseneck type
Tandem axle, tilt-top.

MODEL GPX-D
Tandem axle. Capacities 16 through 35 tons.
Drop or flat deck.

MODEL KSO-D
Oscillating axles, 8 tires in line . . . capacities 15 through 30 tons.
Drop or flat deck.



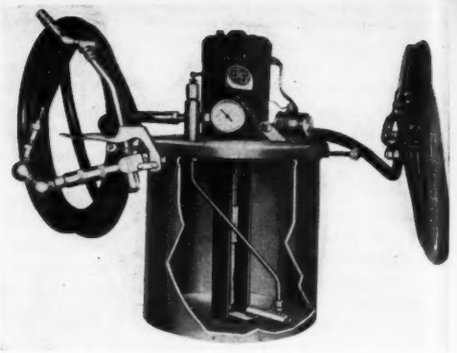
MODEL T-8-18 TILT-TOP

Faster, safer between-jobs hauling of equipment means more on-the-job production . . . more profit to operator. A TRANSPORT between-the-wheels tilt-top is easier to maneuver . . . one man can quickly load front-end loaders, tractors, rollers, mixers, etc., with no lost motion.

8-10-ton capacity . . . 18-foot platform length . . . 76½" clear inside platform width . . .tandem axle walking beam assembly with axle camber . . . automatic platform lock with tilt control optional. MODEL T-8-14, with 14-foot platform bed, also available.

WRITE FOR FURTHER INFORMATION

TRANSPORT TRAILERS, INC.
TRANSPORTATION ENGINEERING A SPECIALTY
CEDAR RAPIDS, IOWA, U.S.A.



The battery-powered Greasemaster Senior.

Greasing Unit Gives Increased Pressure

■ A new version of the Greasemaster battery-powered greasing unit which pumps grease directly from the drum is being offered by G & T Industries, 1420 Barwise St., Wichita, Kans. The Greasemaster Senior features increased pressure range.

Like the earlier model, it operates on a hydraulic ram pump, powered by an automotive storage battery. The pump forces grease through a 25-foot, high-pressure, reinforced hose to a universal grease-gun handle where greasing pressure can be varied from 600 to 12,000 psi.

A standard automotive starter supplies mechanical power. Ten-foot copper cables and high-capacity E2 battery clamps make the power hookup. The grease coupler works on standard fittings, and adapters are available for special fittings.

Total weight of the unit is 40 pounds. Two models are available. Model A-100 fits drums of 14¾-inch maximum outside diameter with a minimum depth of 22 inches. This is the standard-size grease drum in the central states. Model A-110 fits drums of the same diameter but of at least 26 inches in depth—the typical drum used in the west.

For further information write to the company, or use the Request Card at page 18. Circle No. 303.

New Steel Hoist-Tower

■ A lightweight sectional-steel hoist-tower made of prefabricated frames is announced by Patent Scaffolding Co., Inc., 38-21 12th St., Long Island City 1, N. Y. Designed for a maximum load of 4,000 pounds, the new tower can be built up to a maximum height of 130 feet.

The tower consists of a base unit and top channels that slip over the frame legs without requiring clamps or bolts. Self-locking joints between the frames are secured by wing nuts. Portal frames provide openings in the tower at any level.

Height of each frame section is 6 feet 6 inches, with assembled outside dimensions of 6 feet 10½ inches. Platforms are 5 feet 9 inches x 7 feet 5⅜ inches providing a full three-wheelbarrow width.

For further information write to the company, or use the Request Card at page 18. Circle No. 244.

Mack Trucks Elects Slick

Earl F. Slick, chairman of the board of directors of Slick Airways, Inc., has been elected to the board of directors of Mack Trucks, Inc., 350 Fifth Ave., New York 1, N. Y. Mr. Slick is also a partner in the Slick-Moorman Oil Co. and the Slick-Urschel Oil Co.

One lever controls
8 FORWARD SPEEDS
TWO REVERSE SPEEDS
NO GEAR-SPLITTING!

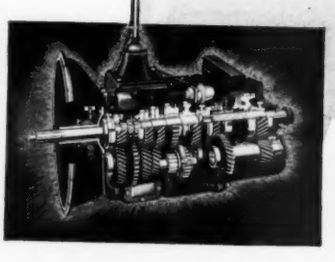
New MODEL R-45 ROADRANGER®

Now 125-160 hp rigs can have the advantages of the new R-45 ROADRANGER Transmission

The famous one-stick Fuller RoadRanger is now available for rigs powered by engines delivering up to 385 pounds-feet of torque.

With the new R-45, gear-splitting is entirely *eliminated*. Shifts are simple, short, and fast, with only one power shift in the whole series. Yet you have 8 forward speeds—available in *equal*, progressive, selective steps, none exceeding 38%—to keep your engine *always* turning in its most efficient range.

With this transmission, there's no more engine lugging, no more low rpm between shifts. With the Fuller RoadRanger, you can haul more, and maintain higher average speeds than ever before—with so much better utilization of horsepower that you make 1/3 fewer shifts. Write today for full information on the new Fuller R-45 RoadRanger.



Check These Advantages:

● Easier, quicker shifts—38% steps—one shift lever controls all 8 forward speeds ● No gear-splitting—8 selective gear ratios, evenly and progressively spaced ● Higher average road speeds—engine operates in peak hp range with greater fuel economy ● Less driver fatigue—⅓ less shifting ● Range shifts pre-selected—automatic and synchronized ● More compact than other 8-speed transmissions ● More cargo can be carried on the payload axle.

VITAL STATISTICS

GEAR RATIOS:

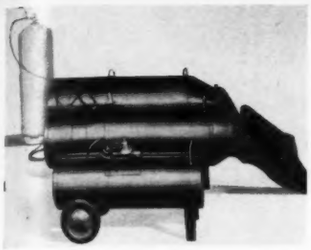
Low Range		High Range	
1st	9.78	5th	2.66
2nd	6.98	6th	1.90
3rd	4.99	7th	1.36
4th	3.68	8th	1.00
Reverse	11.01	Reverse	2.99

Installation Length . . . . . 29¾"
Clutch Housing Sizes . . . . . SAE 1, 2, 3
Weight, with Standard Controls . 457 lbs.

Fuller® TRANSMISSIONS

FULLER MANUFACTURING COMPANY (Transmission Division), KALAMAZOO 13F, MICHIGAN

Unit Drop Forge Division, Milwaukee 1, Wis. • WESTERN DISTRICT OFFICE (SALES & SERVICE—BOTH DIVISIONS), 641 E. 10th Street, Oakland 6, Calif.



The Eco-Temp portable heater.

Portable Heating Unit

■ A line of LP gas portable heating units is made by Arthur C. Baumann, 7013 Grays Ave., Philadelphia 42, Pa. The Eco-Temp heaters feature automatic firing and go into operation when the hose connection to a gas tank is plugged in and a valve is turned. The manufacturer reports that they give off no smoke or odor.

The line is made in three regular sizes that produce up to 500,000 Btu. Two larger models deliver 650,000 and 950,000 Btu for heavy-duty use. All units can be furnished with a durable flame-proof vinyl-coated canvas heat duct for directing the heat to the exact spot required.

For further information write to the company, or use the Request Card at page 18. Circle No. 212.

Load-Bearing Facing Tile

■ A new load-bearing facing tile is announced by the Natco Corp., 327-29 Fifth Ave., Pittsburgh 22, Pa. Uniwall tile makes possible single-unit wall construction with finished facing inside and out. The interior surface is ceramic-glazed, and the exterior finish is natural Buff Range unglazed Rug-Tex.

The tile is of vertical-cell construction and is made of hard-burned de-aired fire clay. The tiles have a jamb slot to receive the fin of a metal window or the blind stop extension of a wood window. A line of interior ceramic-glazed shapes is available to supplement the standard Uniwall units.

Modular dimensions apply to all unit sizes, which are equally adaptable for non-modular construction. With allowance of ⅜-inch mortar joints, the dimensions of the tile are 8-inch wall thickness and 4 x 12-inch face size. The interior ceramic-glazed facing units are 2 inches and 4 inches in thickness, with nominal 4 x 12-inch face dimensions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 286.

Slide Rule Pencil

■ A combination slide rule and pencil that writes in two colors, calculates, and magnifies, is offered by the Device Development Co., 226 W. 4th St., New York 14, N. Y. The Devco Slide-Pen-Cyl has a depth gage, eraser, and lead, and a detachable straight-edge that measures in inches and centimeters. The clip acts as a reading magnifier or enlarging indicator. Conventional scales are debossed into the body of the rule and into the transparent sliding sheath.

For further information write to the company, or use the Request Card at page 18. Circle No. 288.

Motor-Scrapers Described

■ Two booklets describe Allis-Chalmers motor-scrapers of 10 and 14 cubic yards struck capacity. The diesel-powered motor-scrapers are 2-wheeled, rubber-tired, high-speed tractors joined to 2-wheeled scrapers.

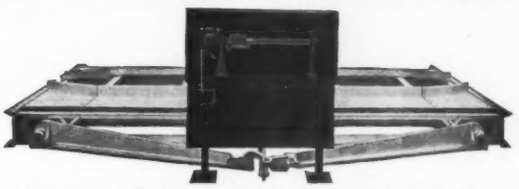
Model TS-200 delivers over 17 hp per yard of payload and is capable of speeds in excess of 21 mph. The hydraulically operated scraper has a heaped capacity of 13 yards and is flexibly hitched to the tractor through a pedestal-type coupling. Steering is done by a pair of double-acting jacks.

Model TS-300, with a heaped capacity of 18 yards, features a cable control unit mounted on the rear face of the gear case. The booklet covers brakes, tires, and engines.

Center spreads are used to illustrate the scrapers and list complete specifications.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 239.

WINSLOW—PORTABLE TRUCK SCALE
"THE CONTRACTORS' SPECIAL SCALE"



For use at temporary and permanent locations—at stock piles and by bituminous material contractors at the job site. Capacities: 15-18-20-30 tons.

Write us for name of your nearest distributor.

WINSLOW SCALE COMPANY
P. O. Box 1198 Terre Haute, Indiana

"In 6 Years, we haven't found an oil to beat TENOL"

says R.E. Campbell County Engineer, Stevens County, Kansas

"The kind of road work we do is tough on equipment and harder still on lubricants," says Mr. Campbell. "Our Caterpillar Diesels often run into rough going – that's why we've been using the best heavy-duty oil we could find. TENOL® has been doing an outstanding job for us since 1948 – it has helped prevent sticking valves and rings – it has done an excellent job of keeping our engines free from sludge and carbon."

By experience Mr. Campbell *knows* that Sinclair markets only top quality products. That is why Sinclair products are used 100% on his equipment. Why don't *you* discover the many advantages of Sinclair lubricants? Phone your Sinclair Representative or write Sinclair Refining Company, 600 Fifth Ave., New York 20, N. Y.

SINCLAIR TENOL prolongs engine life

Suspension Bridge Carries Belt Conveyor

New facility is used to transport gravel economically to aggregate plant from dredging area five miles away.

Gravel moves on the conveyor belt across the 756-foot suspension bridge to a car-loading silo on the opposite bank of the river. Sway braces on the bridge permit all-weather operation.

When American Aggregates Corp. worked out of the gravel area near its Indianapolis, Ind., plant last year, it came up against the problem of finding an economical means of transporting gravel from a new gravel area to its central plant five miles away. Finding the best mode of transportation was made even more difficult by the fact that the gravel source—800 acres of workable land—was located across the White River from the central plant. Already in existence was a company railroad, running from the plant to the river, and one possible solution was to build a bridge across the stream and extend the railroad tracks to the gravel source on the opposite side. Because of the cost involved, this project was shelved while other means of transportation were studied. The answer to the problem was found in the erection of a continuous belt-conveyor system to transport the gravel from one side of the river to the other.

After the gravel is taken from the dredging area and across the river, it is dumped into a carloading silo, then hauled by train to the plant.

Conveyor Bridge Erection

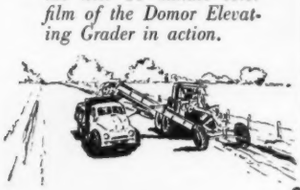
The 756-foot three-span wire-rope suspension bridge was begun in October, 1952. Work on the project was completed early this year. Engineers from the Leschen Wire Rope Division, H. K. Porter Co., Inc., St. Louis, Mo., assisted on cable installation work. Greenville Mfg. Works, Greenville, Ohio, did the design and fabrication work, and Armco Steel Corp., Middletown, Ohio, furnished all of the galvanized metal.

Two spans measure 190 feet 6 inches, and the third, 375 feet. The bridge is rigged with sway braces that permit conveyor operation in all types of weather. Additional protection is supplied by sheet metal half culvert, 42 inches in diameter, which run across the bridge.

The four bridge foundations con-

DOMOR Elevating Grader and Cat DW10's Extend Runway on Greenville Air Base

• *Ask your Caterpillar-Domor Dealer to show you the new 10 minute color film of the Domor Elevating Grader in action.*



Superintendent H. A. Ross says the Domor is the answer to his prayers for fast dirtmoving and is the cheapest method he has ever used.

Burdine Construction Company is using its Domor Elevating Grader for runway extension and drainage on the Greenville, Mississippi, Air Base. Loading into four Caterpillar DW10's with wagons on a two mile round trip haul, the Domor handles an average of 2000 cubic yards of sandy loam daily.

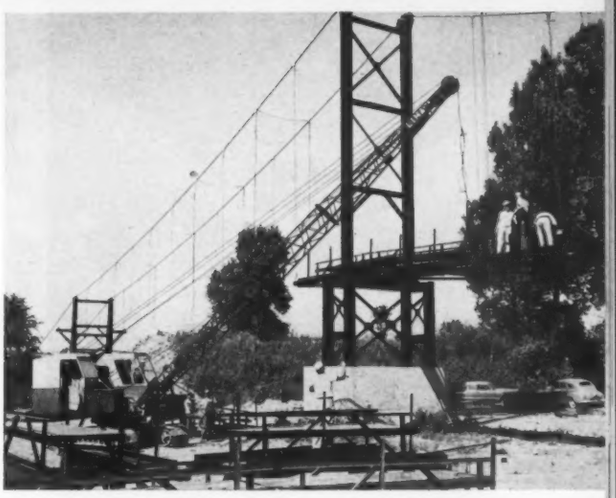
See Your Caterpillar-Domor Dealer

DOMOR
ELEVATING GRADERS
ROAD WIDENERS
SNOW BLOWERS
ULRICH PRODUCTS CORPORATION ROANOKE, ILLINOIS

Ulrich Products CORPORATION
ROANOKE, ILLINOIS

GET the AMAZING FACTS
ON THE PATENTED TROUBLE-FREE BALL BEARING TURNTABLE
Exclusive WITH
LITTLE Giant
CRANES
SHOVELS
TRENCHOES!
1/2, 3/8, 1/4 Yd.
LITTLE GIANT CRANE & SHOVEL, INC.
1530 HOWARD DRIVE, DES MOINES, IOWA

A sheet metal half culvert, 42 inches in diameter, stretches the length of the bridge, protecting gravel from the weather. The 1,985-foot reinforced Goodyear belt moves on anti-friction rollers. Leschen wire rope is used for supporting cable, sway cable, and handrails.



Bridge steel is swung into place by a Lima crane. In the foreground are prefabricated sections to be erected.

structed in the river basin are filled with 100 yards of concrete and the six bridge piers contain a total of 108 cubic yards of concrete. About 11,800 feet of Leschen wire rope are used for handrails, supporting cable, and sway cable. The conveyor uses 1,985 feet of reinforced Goodyear belt that runs on anti-friction rollers. Major items on the job were the excavation and placement of 30,000 cubic yards of earth for track fill and the construction of 600 feet of new levee, built two feet higher than existing levees. This was done to conform with future plans of the Indiana Flood Control Commission. The levee is 88 feet wide at the base and 16 feet wide at the top.

The biggest problem in erecting the bridge was to simplify the addition of sections. This was solved by the use of a portable derrick with a gasoline hoist that was moved onto the bridge as each section was added. Sections were built first on one side of the river, then on the other, until the project was completed in the center.

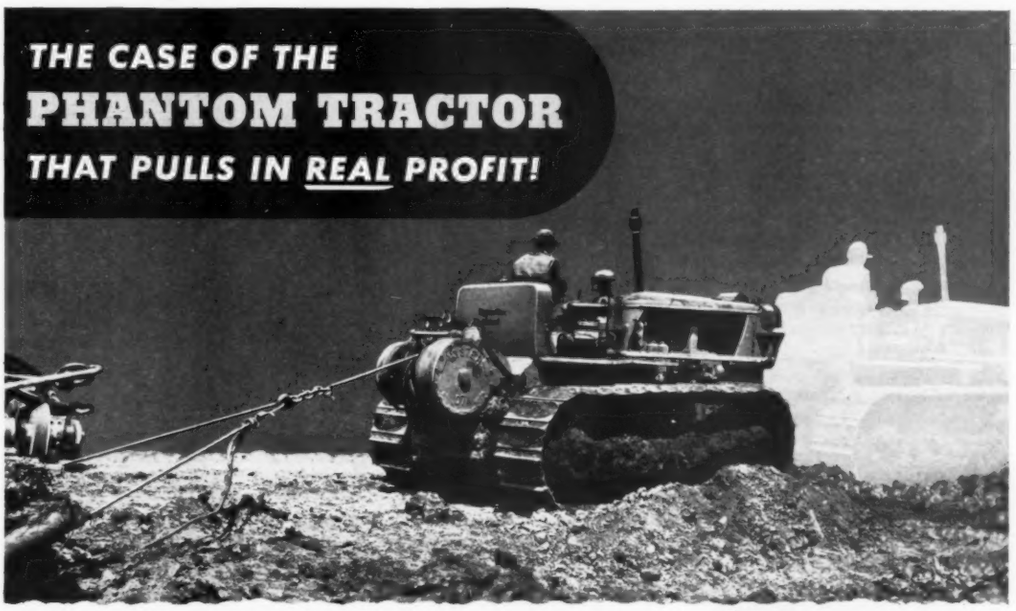
Bridge Conveyor Operation

American Aggregates is using a 20-inch hydraulic cutter-head-type dredge, powered by an Allis-Chalmers motor, in the new digging area. As raw gravel is extracted by the dredge, it is pumped to a desander near the pit. From there, the gravel is conveyed to a storage pile directly over the bridge conveyor intake. Dredging and piling is done at night and the conveyor carries the gravel across the river to the car-loading silo during the day. From there, 40-ton hopper cars take the gravel to the central plant. The two-mile round trip takes about 20 minutes. At the plant, the gravel is dumped into a trestle hopper, then hauled in incline cars to the washing plant. There, it is separated into the various types needed in roadway and construction work. THE END

ROETH

CONCRETE VIBRATORS
MOUNTED ON WHEELBARROW CHASSIS
Write for details and prices
ROETH VIBRATOR CO.
9229 Chestnut Ave., Franklin Park, Ill.

THE CASE OF THE PHANTOM TRACTOR THAT PULLS IN REAL PROFIT!



Ask any progressive owner or operator why he equips his tractor with a Hyster Towing Winch. He'll say, "It's almost like having a second tractor up ahead all the time... ready to help you when you need it most." That's another way of saying Hyster Winches greatly increase tractor uses for more profit.

Hyster Winches increase tractor pull up to 92% over drawbar pull!

Full tractor engine power can be extended the length of the winch-line. Permits tractor to reach out and rescue stuck equipment, pull in logs or heavy objects. Saves time and keeps jobs going in all kinds of weather.

Matched Design of Caterpillar-built Tractors and Hyster Winches provides proper balance to develop maximum tractive effort—with good operating stability and maneuverability.

Only Caterpillar-Hyster has *truly-matched* tractors and winches. Yes, and *only* Hyster has 19 models and sizes of winches to fit all Caterpillar-built tractors and for all types of winch jobs.

THERE'S PROFIT IN HYSTER POWER

Ask your Caterpillar-Hyster Dealer for the *right* winch to increase the profit on your job, or write to:

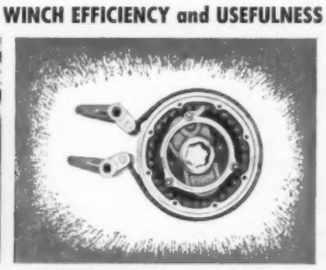
HYSTER COMPANY
2952 N. E. Clackamas .. Portland 8, Ore.
1852 N. Adams St. .... Peoria 1, Illinois

THERE ARE OVER 40,000 SATISFIED HYSTER WINCH OWNERS!

HYSTER TOWING WINCH ATTACHMENTS and FEATURES INCREASE WINCH EFFICIENCY and USEFULNESS

FAIRLEAD ASSEMBLY saves time maneuvering the tractor into yarding position. Reduces wear to winchline and tractor crawler assembly and saves fuel. Permits yarding from any angle to the rear of the tractor without the necessity of leading winchline straight from load to drum. (Optional for Models D8L, D7N, D6N)

BUILT-IN DRAWBAR provides added strength and rigidity to withstand severe vertical stresses encountered in arch logging and certain types of heavy-duty service. Yoke can be set in swiveling or non-swiveling (fixed) position. (Standard equipment on Model D8L, optional on D7N, D6N)



AUTOMATIC BRAKE, of special patented design, permits operator to pre-set brake before winching in a load—eliminates need for close coordination in controlling brake and clutch. For added safety, all brakes can hold loads greater than winchline capacity. (Optional on Models D8L, D7N, D6N)

HYSTER... the most complete line of tractor winches on the market!

The invention of O. K. Stephens of the North Carolina State Highway Commission, this machine will construct a curb of plant-mixed asphalt or soil cement without using any kind of forms.

Curb-Making Machine

A machine that will construct a curb at reasonable cost without the use of any kind of forms has been invented by O. K. Stephens of the North Carolina State Highway Commission. It is designed to use hot, plant-mixed asphalt, but soil cement has also been used successfully.

The machine molds a curb 7¼ inches high with an 8-inch base and rounded sides. One man is required to operate the machine, and two men are usually needed to shovel asphalt into it from a truck moving alongside. When two men do this work, the machine is able to travel at a rate of 10 feet per minute. A truck driver and a utility man for cleanup work complete the crew.

Modular Spacing Rule

■ A mason's modular spacing rule is announced by the Lufkin Rule Co., Saginaw, Mich. One side of the Model 646 rule is marked with a 16-inch repeating series of numbers that show the vertical coursing for concrete block and glass bricks, facing tile, economy brick and small facing tile, engineered brick, standard brick, and Roman brick.

The first section of the rule is four inches long which permits butting the rule on the first 16-inch module. As all other sections are six inches long, the rule can also be used for spacing 6 and 12-inch glass blocks. Its reverse side is marked in consecutive inches in 16ths along both edges.

For further information write to the company, or use the Request Card at page 18. Circle No. 285.

Drafting Equipment Line

■ A line of drafting-room furniture and drawing and tracing equipment is illustrated in literature from the Stacor Equipment Co., 768-778 E. New York Ave., Brooklyn 3, N. Y. The line includes 4 and 5-drawer files for blueprints and drawings, with all models constructed so that the units can be stacked one on top of the other. A variety of steel-based drafting and drawing tables with tilting soft-wood tops and tracing tables with illuminated sand-blasted glass tops is also offered.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 226.

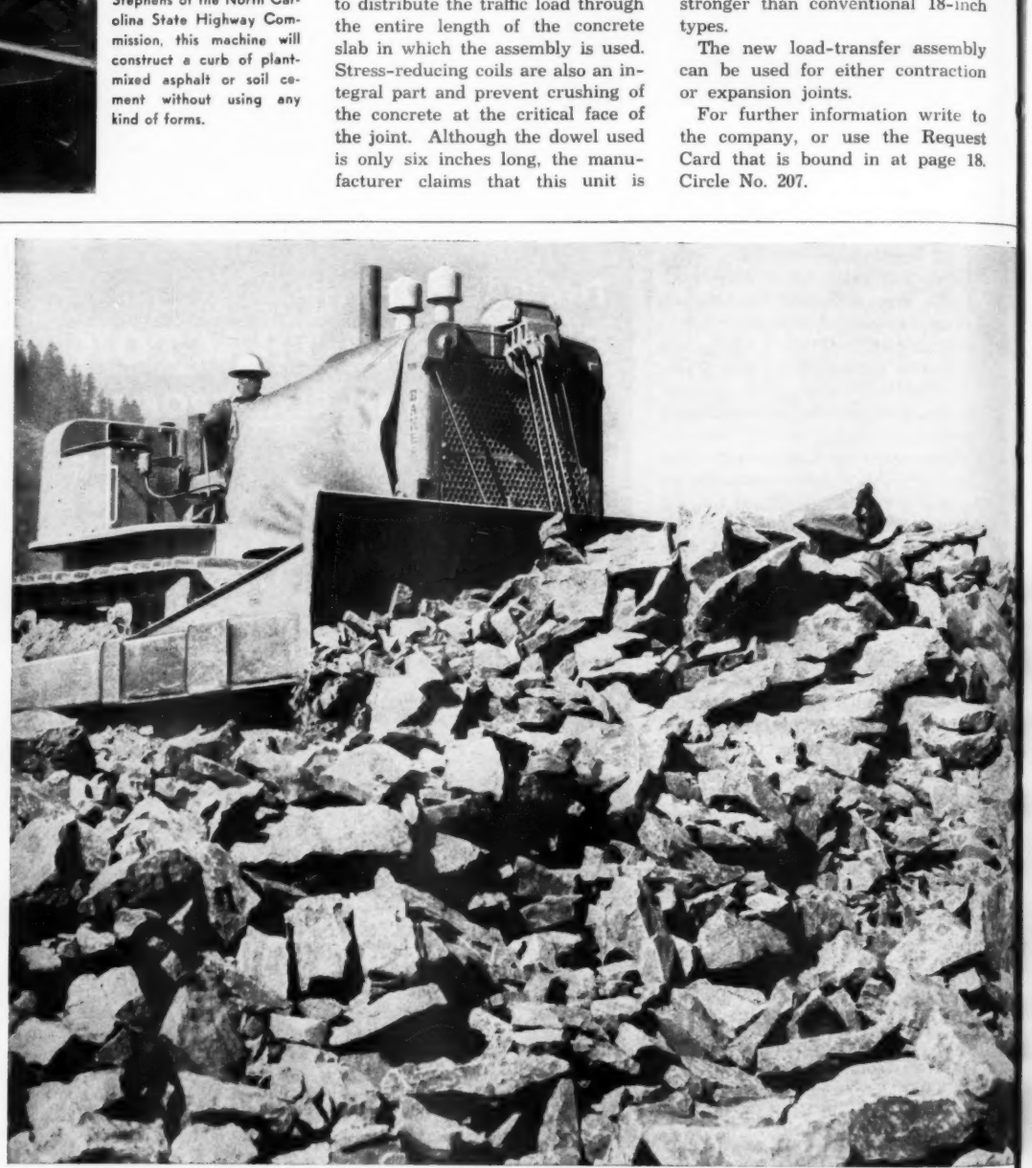
Load Transfer Device For Highway Joints

■ A new road-joint load-transfer assembly is announced by the Richmond Screw Anchor Co., Inc., 816 Liberty Ave., Brooklyn 8, N. Y. The new unit, which weighs only 4½ pounds per linear foot or 54½ pounds in 12½-foot lengths, is said to carry heavier loads than standard road and air base dowel and load-transfer assemblies.

The unit is made with a rod-frame that acts as a working part, helping to distribute the traffic load through the entire length of the concrete slab in which the assembly is used. Stress-reducing coils are also an integral part and prevent crushing of the concrete at the critical face of the joint. Although the dowel used is only six inches long, the manufacturer claims that this unit is stronger than conventional 18-inch types.

The new load-transfer assembly can be used for either contraction or expansion joints.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 207.



AN ALLIS-CHALMERS REPORT

How hydraulic torque converter drive improves big tractor performance—increases job output

With a two-range transmission and hydraulic torque converter, the Allis-Chalmers HD-20 is the only crawler tractor that is capable of exerting maximum drawbar pull *at all times* . . . under all load and terrain conditions . . . without gear-shift guesswork.

Whatever the job, the operator need merely make contact with the load and then open the throttle. As the load requirements change, the hydrau torque converter *automatically* matches the con tions with exactly the right combination of spe and pull.

This eliminates most shifting . . . leads to h more work done in a continuous work cycle . . . l longer equipment life.

Line of Wire-Rope Blocks

■ A booklet on wire-rope blocks is available from Sherman & Reilly, Inc., Broad St. at First, Chattanooga 2, Tenn. The booklet lists specifications for a large variety of sizes and types of blocks.

Standard and heavy-duty steel-shell blocks are available in either diamond or oval shapes. They are furnished with iron or steel sheaves, with a choice of swivel hook, loose hook, shackle, or swivel eye fittings.

The line also includes molded shell tackle and snatch blocks. The former have tubular steel fillers welded into an integral unit.

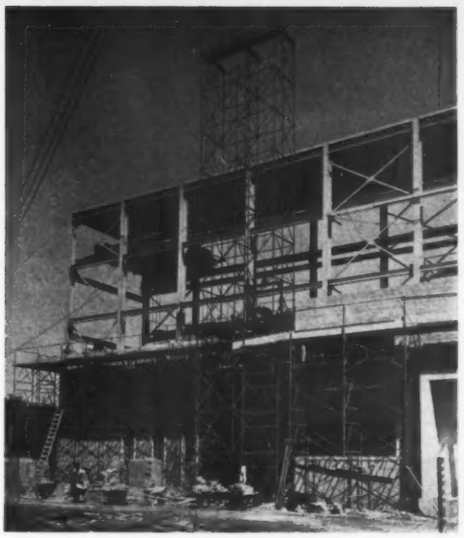
Steel-plate wire-rope snatch blocks are shown in three types: drop link, safety locking, and a heavy-duty model with pin-type head. Other blocks illustrated are all-steel blocks and weighted fall blocks available with any number of sheaves in any size.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 304.

Signs Identify Equipment

■ Literature is available on decal signs that transfer onto equipment to identify it. A standard 20 x 30-inch sign for door panels may include the entire company name, address, and telephone number. The Bing transfer signs are also made in a 6 x 32-inch size for use on truck cabs over the windshield and in the rear. These carry the company name only.

To obtain this literature write to Bing Transfer Signs, Berkley, Mich., or use the Request Card at page 18. Circle No. 290.



A Safway material hoist-tower was used in the construction of a new incinerator plant at Milwaukee, Wis.

Materials Hoist Tower Of Tubular Steel

■ A medium-duty materials hoisting tower is announced by Safway Steel Products, Inc., 6234 W. State St., Milwaukee 13, Wis. The tubular-steel tower has a capacity of 3,100 pounds per hoist and a lifting speed of 160 fpm. Maximum height of a single tower is 200 feet.

The end frames are made of six component parts welded together. They are joined by high carbon steel tubular bracing for strength. All metal parts are treated to resist corrosion.

The hoist tower is equipped with a safety device that stops the cage within inches of the point of cable trouble or failure; a metal bar locks into the cage guide keeping it from moving.

For further information write to the company, or use the Request Card at page 18. Circle No. 269.

Clay-Pipe Specifications

■ A bulletin intended to help engineers prepare specifications using the company's perforated plain-end clay pipe is available from the Bowerston Shale Co., Bowerston, Ohio. The Bosco pipe features the use of spring wire clips to maintain alignment and to secure close joints.

The bulletin describes the role played by the pipe in drainage construction of the Pennsylvania Turnpike and other Keystone State and Ohio highway projects. It includes excerpts from specifications for these projects.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 205.

Overload Release Clutches

■ Overload release clutches for sprocket, chain, belt, or gear drives are shown in literature from the Centric Clutch Co., P. O. Box 175, Woodbridge, N. J. The clutches, which act as safety devices, can be used over a wide range of speeds and shaft sizes.

A table lists specifications for units for maximum torques up to 25,000 inch-pounds. Special sizes can be made to order.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 225.

BULLDOZING — Hydraulic torque converter lets Allis-Chalmers HD-20 take full advantage of available horsepower, roll bigger loads, tackle tougher dozing jobs. With full control at the throttle, operator can work safely and efficiently, regardless of terrain.

PULLING — Hydraulic torque converter drive actually multiplies torque up to four and one-half times... develops tremendous drawbar pull to start the load smoothly . . . and automatically accelerates to the highest speed that conditions permit, in either high or low range.

PUSHING — Operator just makes contact, then opens the throttle and relaxes. The HD-20 automatically matches speed to that of pushed equipment, maintains steady contact while loading, sends load off to the fill at higher speed.

DIGGING AND LOADING — With the HD-20G, the operator crowds surely and steadily, using only throttle and bucket levers. With full horsepower always available even at creeping speed, he can work effectively in mud, on hillsides or the edges of banks.

OPERATOR COMFORT AND EFFICIENCY — He chooses speed range when he starts, and he can finish most jobs without further clutching or shifting (except for reverse). Result — he works easily, yet efficiently all day long.

LONGER LIFE FOR BIG EQUIPMENT — Hydraulic cushioning reduces shock and vibration, with less strain, less wear on both the HD-20 and its auxiliary equipment, whether mounted or drawn. That means *less* downtime, *more* production time.

Hydraulic torque converter drive, exclusive as standard equipment with Allis-Chalmers, is just one of many reasons why the HD-20 assures you higher output with less upkeep. Your nearby Allis-Chalmers dealer invites you to get the full story . . . and to see it in action.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

Weight — 41,000 lb.
175 net hp. at flywheel

A Barnard & Leas elevating grader, attached to a Galion motor grader, works on a Terry County highway in Brownfield, Texas.

Wire-Rope Dispenser Saves Dozer Cable

■ When a section of wire rope on a bulldozer shows wear, about 65 feet of rope is used to rethread the blade. Installation time is costly. There is usually a 50-foot section on the broken cable showing no wear but it is unusable because of its short length.

The LeTourneau - Westinghouse Co., Peoria, Ill., has adapted a wire-rope-saving method for dozers that has been used on scrapers with success. A 14-inch storage reel, which holds 150 feet of ½-inch Tournarope, is equipped with a bracket that can be welded or bolted on a tractor. Cable from the Tournarope bantam reel is threaded through the dead end of the unit, through the sheaves, and to the power control unit.

When a section of rope shows wear, usually at the power control unit point, it is cut off, and an amount of wire rope equal to the section cut off is pulled from the storage reel and reattached to the power control unit.

The reel holds enough rope for many days of operation. Only a short time is needed to pull the worn section of the cable through and cut it off. As many as six cuts can be made under the new method, with a saving of 50 feet of rope for each cut.

For further information write to the company, or use the Request Card at page 18. Circle No. 305.

Rotary Snowplows Mount Front-End Loaders

■ Rotary snow plows for wheel-type tractor-loaders are illustrated in literature from the Wm. Bros Boiler & Mfg. Co., 1057 Tenth St., S.E., Minneapolis 14, Minn. The main component of the snowplow is a slit-spiral combination rotor-feed rake that slips the snow as rapidly as the moldboard area fills, hurling it up and out of the casting chute. A knifing action of the slits prevents packing of the snow around the rotor-hub.

The Series A Sno-Flyr can handle three to four tons of snow a minute. It attaches to the front-end loader with the same pins and connections used to attach the loader bucket. It will fit most units with a lifting capacity of 1,000 pounds. On lighter tractor loaders, it is necessary to mount a simple ballast box on the rear to balance the weight of the rotary plow and engine. The loader used must have a hydraulic bucket-tilting device to provide a positive operating control on the plow at different elevations.

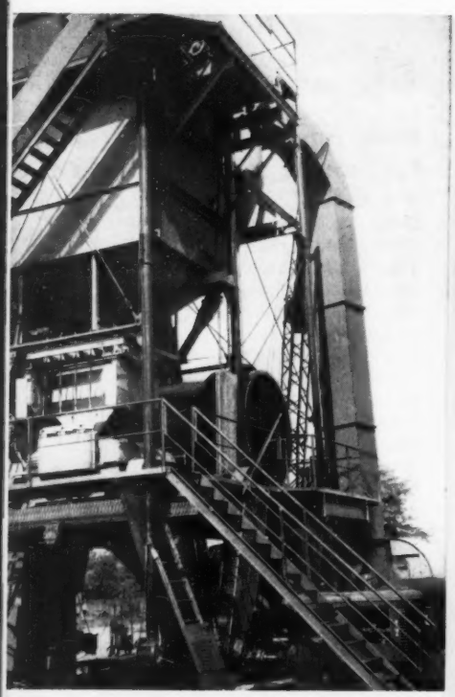
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 251.

Chain Belt Appointments

J. C. Merwin has been elected chairman of the board of directors of the Chain Belt Co., Milwaukee, Wis. L. B. McKnight has been named to succeed Mr. Merwin as president and chief executive officer of the company.

In a series of other personnel changes, A. R. Abelt, formerly vice president in charge of field forces, has been made vice president of sales. George W. Woodland has been appointed to the newly created position of manager of field forces for the company's industrial divisions.

Other promotions include Gilbert J. Schuelke, now sales manager of the Chain and Transmission Division; and W. C. Messinger, assistant divisional manager of the Construction Machinery Division. Mr. Messinger has also been elected secretary of the Baldwin-Duckworth Division to replace George D. Gilbert who has resigned as an officer, division manager, and director. Edward M. Rhodes has been promoted to division manager, and Roland V. Poisson has been made sales manager.



Simplicity system Asphalt Plant, Diamond Chain employed for all drives.

Coordinating Many Functions Via DIAMOND ROLLER CHAINS In Simplicity System Asphalt Plants

Positive long center drives,—one from Dryer extension shaft to cold elevator and one from countershaft to elevator headshaft.

Fuel oil pump drive. Could any other power transfer medium be as practical?

Two double-strand Diamond Chain Drives,—one to Dryer and the other to Tower.

IMPORTANT DIAMOND ADVANTAGE—PITCH HOLE PREPARATION

Maximum rigidity of links insured by special pitch hole preparation for 100% effective bearing area of pin and bushing. Longer life, smoother operation.

SHOT-PEENING SINCE 1944

Diamond Chain has long recognized that certain types of internal stressing of chain parts would increase fatigue resistance. To this end, link plates have been specially processed and chain rollers and other parts have been shot-peened since 1944.

● Operating outdoors subjected to the elements — with long center distance drives, Diamond Roller Chains provide the ideal method of correlating the many functions of the Simplicity System Asphalt Plant.

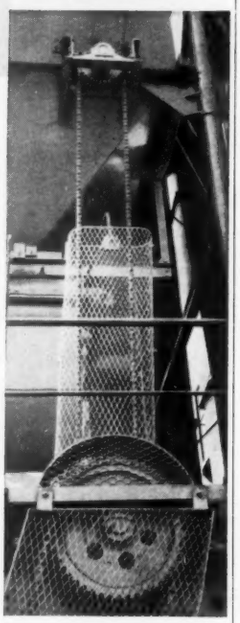
These chains insure positive non-slipping drives, high-efficiency, maintained speed ratios, easy installation and maintenance. Their great reserve strength and *uniform* high quality insure dependable long-life performance that machinery design engineers and users demand.

DIAMOND CHAIN COMPANY, Inc.
Dept. 487, 402 Kentucky Avenue,
Indianapolis 7, Indiana

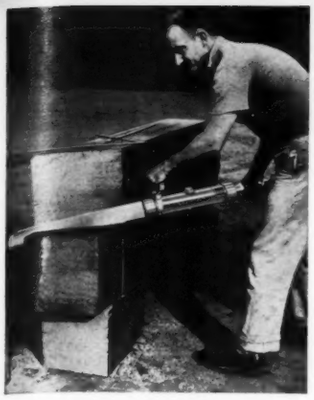
Offices and Distributors in All Principal Cities

Refer to the classified section of your local telephone directory under the heading CHAINS or CHAINS-ROLLER

DIAMOND ROLLER CHAINS



Diamond Chain Drive from mixer countershaft to double idler and from here to screen.



The new Model AS-221 Wright air-powered saw with reciprocating twin-blade.

Improved Air Saw Model

■ An improved model of its reciprocating-blade pneumatic saw is announced by the Wright Power Saw & Tool Corp., 292 Longbrook Ave., Stratford, Conn. Model AS-221 is reported to be of heavier construction than its forerunners and has a new control handle. The saw can cut in hard-to-get-at places and can cross-cut, rip, or angle through an 18-inch timber. It also cuts circles with a 12-inch minimum radius.

Other features include a hard chrome-plated cylinder, a locked-in pinion shaft, and stronger saw blades. Cutting speed of the new model is said to be faster than that of earlier versions.

For further information write to the company, or use the Request Card at page 18. Circle No. 206.

Hydraulic-Hose Selector

■ A pocket device is offered that will help select rubber-covered hydraulic hose for any use. It is made available by the Republic Rubber Division of the Lee Rubber & Tire Corp., Youngstown 1, Ohio, manufacturer of Wiretex rubber-covered hydraulic hose.

Starting with any known factor, such as the ID or OD, minimum burst, working pressure required, or bend radius, a maintenance man can use the selector to determine the proper rubber-covered hydraulic-control hose for the operation in which the hose will be used.

To obtain this selector write to the company, or use the Request Card at page 18. Circle No. 213.

Compact Gas Heater

■ A new, compact, gas-fired unit heater is announced by the Carrier Corp., 300 S. Geddes St., Syracuse, N. Y. The heater is 23 inches high, 23 inches deep including fan and motor assembly, and 19½ inches wide. Capacity is 1,500 Btu per hour.

The gas is fired directly into the tube of an all-welded heat exchanger made of a corrosion-resistant aluminized steel. The heat exchanger is said to withstand temperatures up to 900 degrees F without discoloration and up to 1,600 degrees F without scaling.

The manufacturer reports that the new unit is approved by the American Gas Association for use with all types of gas.

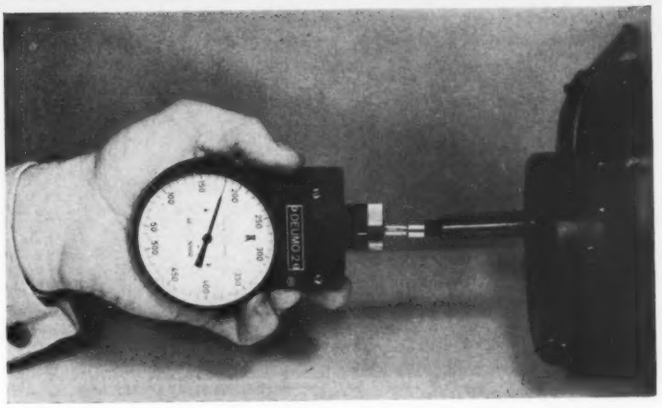
For further information write to the company, or use the Request Card at page 18. Circle No. 233.

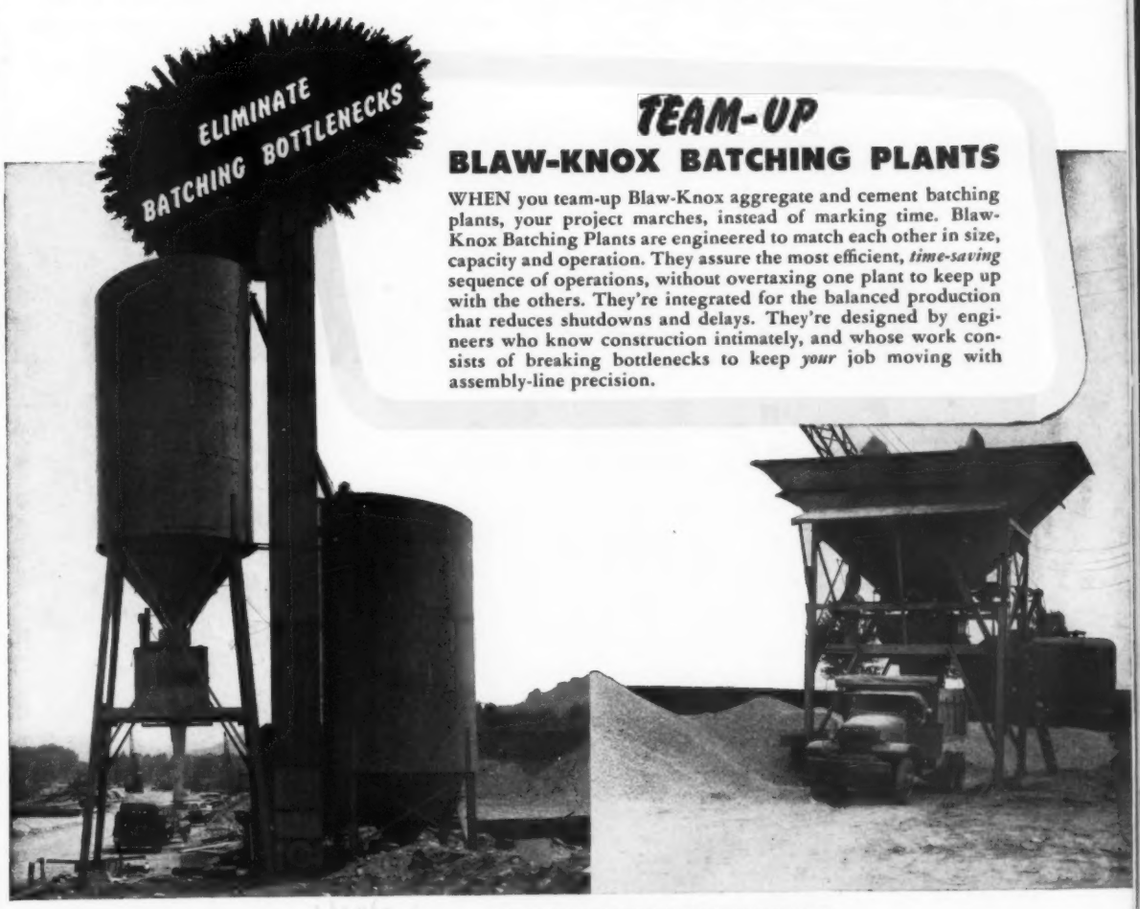
Device Tests Motor RPM

■ A portable instrument for checking the revolutions per minute of motors, machinery, and revolving shafts is announced by Montgomery & Co., Inc., 53 Park Place, New York 7, N. Y. When the rubber tip of the hand-sized device is held against the revolving shaft, the rpm may be read on the dial of the instrument.

Minimum speed is 40 rpm and maximum is 50,000 rpm. The device is housed in a metal cover and comes in a leatherette case.

For further information write to the company, or use the Request Card at page 18. Circle No. 306.





TEAM-UP
BLAW-KNOX BATCHING PLANTS

WHEN you team-up Blaw-Knox aggregate and cement batching plants, your project marches, instead of marking time. Blaw-Knox Batching Plants are engineered to match each other in size, capacity and operation. They assure the most efficient, *time-saving* sequence of operations, without overtaxing one plant to keep up with the others. They're integrated for the balanced production that reduces shutdowns and delays. They're designed by engineers who know construction intimately, and whose work consists of breaking bottlenecks to keep *your* job moving with assembly-line precision.

MECHANIZE EVERY STEP!

Use the BLAW-KNOX
"Complete Package"
for every concrete paving job

100% mechanization of your paving set-up is the answer to today's high-speed paving operations. The Blaw-Knox "Complete Package" contains every piece of equipment you need for assembly-line operation . . . from Clamshell Buckets, Batching Plants and Forms to Subgraders, Pavers, Spreaders and Finishers. Your "Complete Package" is a one-source team of money-making equipment, backed by one undivided responsibility, and with one distributor source for prompt, expert parts and maintenance service on all your package equipment. Call your Blaw-Knox distributor today.

BLAW-KNOX BULK CEMENT PLANTS

The Model BCPC 400-B Portable Bulk Cement Plant illustrated above has 400-bbl. storage over the electrically interlocked Weighing Batcher, and 400-bbl. ground storage over the conveyor screw. Bins are interchangeable and the tank portion is one-piece welded construction with symmetrical base plates. The round bin design assures the utmost portability and speed of erection. Available with 200-bbl. or 400-bbl. bins and in combinations which double these capacities.

BLAW-KNOX AGGREGATE BATCHING PLANTS

The Blaw-Knox 100-ton 3-compartment Portable Aggregate Plant shown above is equipped with a 1¼-yd. Automatic Weighing Batcher for loading batch trucks. Filling gates are opened in sequence by a single electric motor which is intermittently energized by simple automatic control in the dial stand. Portable Batching Plants are available in 2, 3 and 4-compartment styles and in capacities ranging from 100 to 120 tons. Aggregate Weighing Batchers, both conventional and twin types, are included.

BLAW-KNOX

BLAW-KNOX
EQUIPMENT DIVISION
OF BLAW-KNOX CO.
Farmers Bank Building
PITTSBURGH 22, PA.
Offices in Principal Cities

High school graduates in the University of Michigan's summer course at its facilities in Camp Davis, Wyo., start their day early. The program gives students the equivalent of a freshman engineering background, plus vocational training they will find useful as highway department employees.

Michigan Recruits Civil Engineers

The University of Michigan, the State Highway Department, and Michigan Road Builders' Association sponsor new program

FOR A NUMBER of years, and particularly since the end of World War II, contractors, municipalities, and highway groups across the nation have been concerned about the serious shortage of civil engineers and trained engineers' aides. Of the reasons given for the shortage, probably one of the most important has been the boom in programs of street and highway construction, industrial expansion, and internal improvement since the end of the war. All these activities, requiring large numbers of civil engineering aides, have further depleted the supply of trained personnel.

Michigan's extensive highway, municipal, and industrial construction programs—like those in other states—have been hit hard by the shortage. And this has happened despite the state's high level of salaries for civil engineers and engineering aides.

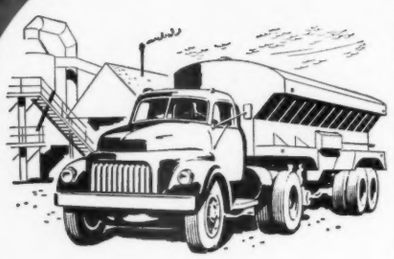
Faced with this situation, George M. Foster, chief deputy commissioner of the Michigan Highway Department and chairman of the Manpower Committee of the Michigan Engineering Society, sought help from the University of Michigan. Placing a personal call to Earnest Boyce, chairman of the university's Department of Civil Engineering, Foster explained the situation: the state, engaged in the greatest construction program in its history, was scraping the bottom of the barrel for civil engineers and trained highway employees.

The call resulted in a meeting in Boyce's office, out of which grew a program specifically designed to stimulate graduating high school students' interest in the engineering field.

Program a Supplement

This recruiting program was a

Drivers say—"Eaton 2-Speed Axle trucks are easier to handle, safer to drive."



Operators say—"Eaton 2-Speed Axles cut hauling costs, make trucks last longer."

More than a million-and-a-half Eaton 2-Speeds in trucks today! For complete information, see your truck dealer.

EATON — AXLE DIVISION — MANUFACTURING COMPANY
CLEVELAND, OHIO

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings • Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

dry wet materials

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Left to right are George M. Foster, chief deputy commissioner of the Michigan Highway Department; Earnest Boyce, chairman of the Department of Civil Engineering, University of Michigan; and C. J. Carroll, executive secretary of the Michigan Road Builders' Association, who worked together to set up the recruiting program.

complement to Michigan's Highway Career Plan, started in 1949, to enlist trained help for the highway department. Under this plan, college students passing the civil service examination for Engineering Aides B are offered summer employment with the highway department at a starting salary of $236 per month. The salary is based on a sliding scale and permits the student to advance one step each summer. Working for a three-month period each year, the student has his Civil Service status protected. After graduation, the students are eligible — together with all other college graduates — to take the examination for Engineering Trainee 1. Those accepted work for a period of seven weeks in each of the highway department's seven divisions. Then they take a test for the Engineering Trainee 2 classification, which pays $394 per month. This classification provides raises over a four year period to a maximum of $460 per month. This program was not providing sufficient trained personnel to meet the demand of the department, however, and it was evident that some type of program was needed to capture students' interest in civil engineering and highway work before they started college.

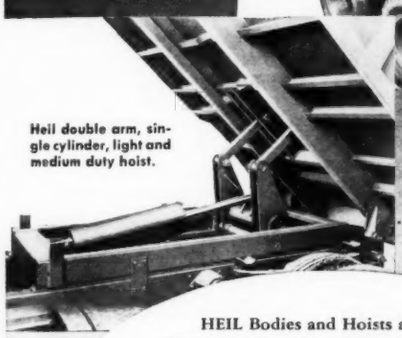
Program Started

Boyce estimated that the university's summer school facilities at Camp Davis, a 120-acre plot near Jackson, Wyo., could accommodate up to 30 additional students. Next came the problem of what kind of courses could be offered, how students were to be selected, and how the program was to be financed. The question of financing was answered by C. J. Carroll, executive secretary of the Mich-

(Concluded on next page)

Here's what makes "HEIL EQUIPPED" DUMP TRUCKS PAY-OFF!

Heil double arm, twin cylinder, heavy-duty hoist.



Heil double arm, single cylinder, light and medium duty hoist.

HEIL Bodies and Hoists are built with *your* job in mind . . . to pay off in profit. Heil hoists are fast-acting . . . in less than 12 seconds bodies are elevated to 50° or more! The rugged arm assembly is designed for strength, without dead weight. The simple toggle principle of the linkage eliminates troublesome parts, requires extremely low oil pressure. Check these other Heil dump unit advantages: Lightweight design for bigger payloads; no-sag floor construction for long body life; low mounting height to make hand-loading easier.

THE HEIL CO.

Dept. 3113, 3003 W. Montana St., Milwaukee 1, Wis.
Factories: Milwaukee, Wis.—Hillside, N. J.

BH-7

Sales Offices: New York, Union, N. J., Washington, D. C., Atlanta, Cleveland, Milwaukee, Detroit, Chicago, Kansas City, Denver, Dallas, Los Angeles, Seattle; Rio de Janeiro, Brazil.

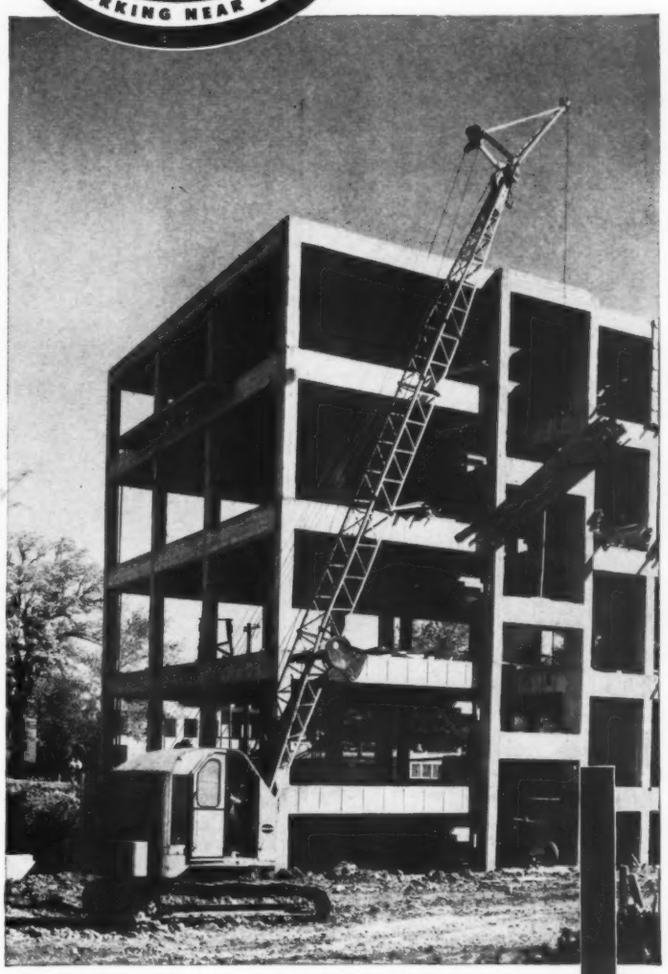
HEILINER 13 AND 18-CU. YD. SCRAPERS

HEILINER 20-CU. YD. BOTTOM DUMP WAGON

CONTRACTOR'S BODY

THERE'S AN INSLEY WORKING NEAR YOU

ON A CONSTRUCTION PROJECT



The Insley Line includes excavators and cranes, 5 to 30 ton capacity—rubber or crawler mounted — gasoline, diesel or electric powered. There's an Insley working near you on a construction project.

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wholly owned subsidiary
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Michigan Recruits

(Continued from preceding page)

igan Road Builders' Association. Keenly aware of the shortage of civil engineers, the association agreed to underwrite about 50 per cent of the program's cost. Tuition fees, board, and other expenses amounted to about $220 per pupil. The Association appropriated $100 per student in the form of student aid, depositing the money with a university fund.

Working with Foster and Carroll in setting up the program was Professor Donald Cortright of the civil engineering department of the University of Michigan. The university's regular summer course at Camp Davis, two separate four-week courses, was reorganized into one closely knit eight-week period. The program was designed to give the student all the civil engineering background usually received during his first year in college, plus vocational training that would benefit him as a highway department employee.

Incentives Offered

Circulars and pamphlets were distributed throughout Michigan high schools, followed by the release of more detailed information and the distribution of enrollment blanks. In order to qualify for the course, high school graduates had to complete a high school course in trigonometry, pass the university's entrance examinations and the Michigan Civil Service examination for Engineering Aide B.

The program was made particularly attractive to graduating high school students through a special arrangement with the Civil Service Department. Students completing the first course were offered jobs as Engineering Aides B with the highway department at a starting salary of 253.56 per month, plus per diem expenses while in the field. The normal initial salary for this classification is $231.29, and the top pay of $3,296 is usually attained in six-step raises. Under this arrangement, students started work at the second pay level and could advance to top pay within three years. An additional incentive was offered by the university: it gave credit for work successfully completed at the camp to students who preferred to continue their civil engineering studies at the university rather than go to work.

Students Selected

Thirty students were finally chosen to attend the first course. Out of this group, only one student later changed his mind and dropped out, deciding that engineering was not his field. Of the balance, 16 went to work for the highway department after completing the course, seven of them starting work on a temporary basis with the hope of studying civil engineering in college at a later date. One of them has already returned to the university this fall after tendering his resignation to the department.

Progress reports on students' work were made monthly by highway department division heads. From time to time, students were interviewed about their programs and, in some cases, these discussions led students to choose a different kind of highway work to study.

The Michigan Highway Department, the Michigan Road Builders' Association, and the University of Michigan, after sponsoring the initial program, feel that the plan has served a twofold purpose. It has recruited sorely needed employees for the highway department and proved that interest in civil engineering can be motivated among high school students.

The university has already expressed a willingness to continue the course next summer, and Michigan State College is studying the possibility of providing additional facilities for the program. Meanwhile, the Michigan plan has attracted the attention of other states having serious manpower shortages in the civil engineering field. The University of Kentucky, the University of Colorado, and Georgia Institute of Technology have made inquiries about the program, and there are indications that similar programs will soon be undertaken in those states.

THE END

Hyster Promotes Woodley

The Hyster Co., Portland, Oreg., manufacturer of cranes, rollers, and winches, has promoted James L. Woodley to the position of general service manager. Formerly the production manager at the Danville, Ill., factory, Mr. Woodley will now work out of the Portland office.

20 Second START
FOR STUBBORN DIESELS with
STAVIS STARTING FLUID
Pour or spray into air intake. Used by diesel operators everywhere. Some distributor territories still open.
Sure, quick starts. Save batteries. Save time. Save money.
Write for details today.
$30. PER CASE SHIPPED PREPAID
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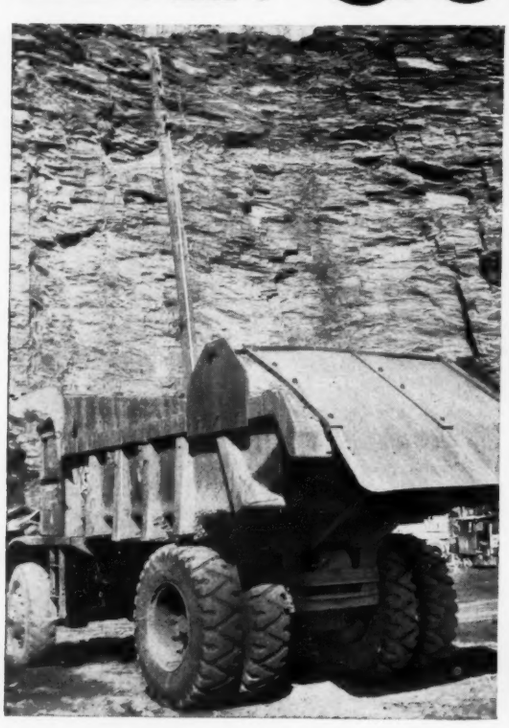
B.F.Goodrich



Off-the-road tires carry 30 tons 4,500 hours a year

THE trucks of the Penn Dixie Cement Corporation, Nazareth, Pa., roll over a rock-strewn quarry floor, then back up a steep incline to dump their load of rock. This rugged hauling job goes on more than 80 hours a week—with 15 tons of rock plus a truck weight of 15 tons for the tires to carry.

For such punishing work, the company uses B. F. Goodrich tires exclusively. The report: these tires stand up so well they can be recapped *twice* for 90% of new-tire service per recap! The tires in the picture have already run more than 4,300 hours. The patented B. F. Goodrich nylon shock shield is one reason for this amazing record.

Layers of strong, elastic nylon cords under the tread stretch together to protect the tire body from rock cuts and bruises. This means you get more original hours of service, more recappable tires and more hours of service per recap, increased bruise resistance and less danger of tread separation. You save 4 ways, yet you pay nothing extra for the exclusive nylon shock shield.

B. F. Goodrich Universal tires are built with a specially-compounded tread that resists snags and cuts, gives 2-way traction and longer wear. This is one more reason why you get better performance from B. F. Goodrich off-the-road tires. See the complete money-saving line at your B. F. Goodrich retailer's store. The address is listed under Tires in the Yellow Pages of your phone book. Or mail the coupon below.

Specify B. F. Goodrich tires when ordering new equipment

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Please send:
- ☐ Catalog on Universal tires
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- ☐ Name of my nearest retailer

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Announce New Welders

■ Two new 300 and 500-amp ac welders are announced by the Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y. The welders feature fast range-changing with a new range switch. There are no leads to punplug and no connections to make.

The manufacturer points to the power saved with the primary switch that turns off the current at the welder between welds.

A large fan forces ventilation to cool the parts and the case.

For further information write to the company, or use the Request Card at page 18. Circle No. 302.

Debris Is Screened By Dredging Ladder

■ Aggregate producers employing hydraulic dredging to obtain sand and gravel will be interested in literature on a traveling-chain device that screens boulders and debris out of materials entering a dredging pump. Sketches show how the traveling chain on the Swintek ladder continuously passes over the suction nozzle of the dredge to keep boulders from getting in and clogging up the suction line.

The cutter bars on the traveling chain also serve to agitate the deposit to increase the intake of solids and hog through clay strata to get at sand and gravel. Three standard models are available for different deposit conditions. On-the-job pictures illustrate many types of suction dredges equipped with the screening ladders.

To obtain this literature write to the Eagle Iron Works, 159 Holcomb Ave., Des Moines 13, Iowa, or use the Request Card at page 18. Circle No. 281.

International Mfg. Sells One-Third of Its Stock

Three Minnesota businessmen have purchased a third of the stock of the International Mfg. Co., Denver, Colo., and have been added to the company's board of directors. They are Oliver Ellingson, H. P. E. Skoglund, and P. J. Sundberg.

Vernon Hines, who has been head of the company since it was founded in 1945, continues as president and secretary. Ralph H. Ennis remains executive vice president and treasurer, and C. A. Brown, as vice president. The firm manufactures a line of portable LP gas-fired heating equipment under the trade name Chinook Wind.

Air-Pressure-Line Devices

■ A line of air filters, pressure regulators, and oil fog lubricators for air-powered tools and machinery is illustrated in literature from the C. A. Norgren Co., 3400 S. Elati St., Englewood, Colo. The units mount singly or in combinations directly on the air line.

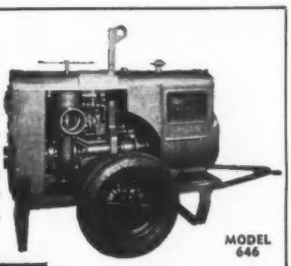
The air filters feature replaceable bowls and have filter elements with a surface area up to 47 times the area of the pipe opening. The air-pressure regulators are offered in standard and relieving types for reducing line pressures up to 400 psi to working pressures up to 250 psi. Sizes available fit ⅛-inch through 1-inch lines.

The oil-fog units that lubricate the air powering the tool or machine are available with metal bowls for pressures up to 250 psi and temperatures up to 300 degrees F. They handle up to 150 psi and 120 degrees F with transparent bowls. Relief valves, manual control valves, air governors and needle valves, hose assemblies and couplings, and blow guns are also offered in the company's line.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 292.

IT'S HERE AT LAST!

A sure way to save money on your next wellpoint job is to get Foundation's new 4" 1000 GPM capacity pump . . . sturdy, compact, for medium and small wellpoint jobs. Why use big 6" and 8" pumping units and pay big fuel bills when you can use this efficient 4" pump, tailor-made for the job? Economical to operate and maintain . . . easy to move around.



MODEL 646

Foundation Equipment CORPORATION

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Chicago Illinois 2608 W. 111th St. Hillitop 5-1945

4" unit powered by 4-cylinder gas engine

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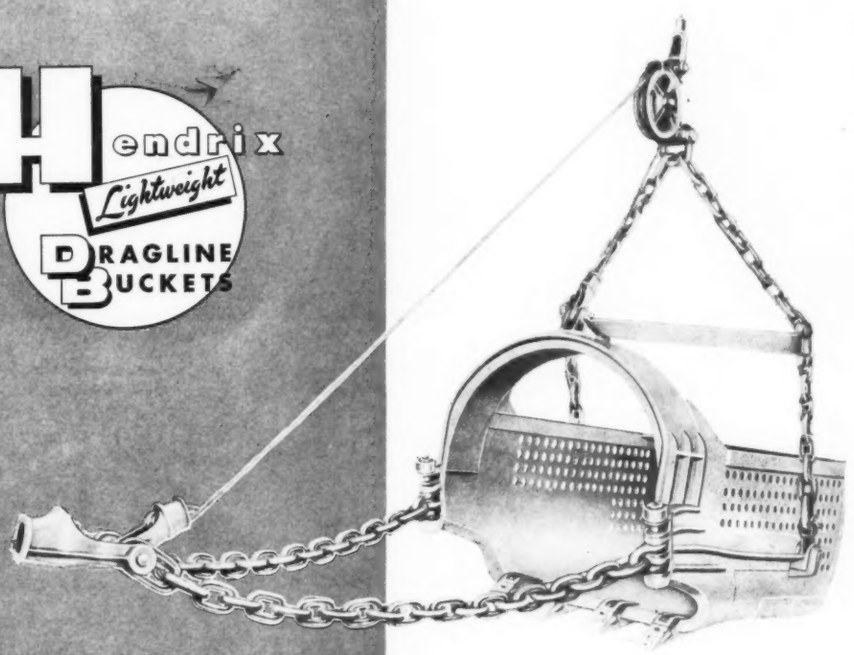
IT'S TRUE! Whatever the material . . . you get BIGGER LOADS with Hendrix Dragline Buckets . . . designed and built to eliminate excess weight without affecting the vital strength and rigidity of the bucket. This combination of minimum strength and durability assures EXTRA PROFITS on every job!



⅜ to 40 Cubic Yards

A TYPE AND SIZE FOR EVERY DIGGING PURPOSE

Hendrix Buckets available without perforations on special order.

HENDRIX MANUFACTURING CO., Inc.

MANSFIELD, LOUISIANA

Management

Insurance Is Part of the Construction Job

Adequate coverage, special clauses, preventive work—problems insurance companies can help contractors solve

From a paper by Cole Allen, Atlantic Division Manager, Engineering Dept., American Mutual Liability Insurance Co.

THE PHENOMENAL RISE in insurance rates, difficulties in obtaining insurance coverage, particularly broader types of coverage, have been only some of the host of problems encountered by contractors in dealing with insurance companies in recent years. All these difficulties have resulted in a strained relationship between contractors and their sources of insurance. But they are only one side of the problem.

Insurance companies have had to grapple with critically poor underwriting results for bodily injury and property damage; they have had to pay out larger sums than ever before for injury and damage; and they have had to work with inadequate information concerning the risks they assumed. Their problems, in turn, have had a direct influence on their growing unwillingness to assume liability and on the skyrocketing insurance costs.

Cooperation Important

Both contractor and carrier will find in increased cooperation perhaps the most important means of overcoming their respective problems, which are actually different sides of the same problems. On the part of the contractor, cooperation means not only working actively with his carrier, but gaining an understanding of liability insurance situations.

When planning a bid, a contractor can make the most effective use of his carrier by allowing representatives to review plans and specifications for the job as soon as is practicable. This gives the contractor a chance to obtain information on the adequacy of his insurance and any unusual liabilities he may be assuming. These are contained in the indemnificiation, save-harmless, or insurance clauses in the specifications. At this time also, the contractor and carrier can agree on important loss potential and measures to be taken to prevent any loss. In this connection, the contractor should be able to assure against any loss on jobs involving dewatering, pile driving, excavating, or underpinning.

In addition to reviewing plans and specifications, the insurance company will usually conduct a careful job site survey to find out what needs to be done to prevent damage of any kind. Safeguards may be recommended to insure against loss in particular cases. This may involve additional construction work or specific methods of work to be followed. The carrier will probably require sufficient control over operations so that loss can be held to a minimum.

Additional Expenses

If the company prescribes methods by which work must be done to cope

Two Men Can Easily Handle 14-ft Sections of Sheet Steel Culvert

You don't need special lifting equipment to unload and place long sections of galvanized-sheet-steel culvert pipe.

Take the 18-in.-diameter pipe pictured above. It is 14 ft long and it weighs 214 lbs. Two men can unload and place it in a trench in a few minutes, without equipment.

Large-diameter galvanized-steel pipe weighs only a fraction as much as pipe made of other materials. It comes in longer sections that are easier to ship.

NUMBER OF FIELD JOINTS REDUCED

The longer sections require fewer field joints, a feature that saves costly man-hours. Three 14-ft sections, for example, can be assembled into a 42-ft culvert by means of two field joints.

Bethlehem does not fabricate culvert or drainage pipe, but does manufacture the Beth-Cu-Loy galvanized-corrugated and flat steel stock used by pipe fabricators. This copper-bearing steel more than meets the specifications set by the American Association of State Highway Officials. It carries a 2-oz zinc coating, as determined by the triple spot test. It comes flat or corrugated, in gages from 8 to 16, inclusive; in lengths 60 in. to 156 in.

Any Bethlehem sales office will gladly furnish detailed information on Beth-Cu-Loy, and the names of fabricators who use it. Write or phone.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETH-CU-LOY *GALVANIZED* CULVERT SHEETS

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— FOR —
Rock Drills, Pavement Breakers and Clay Diggers

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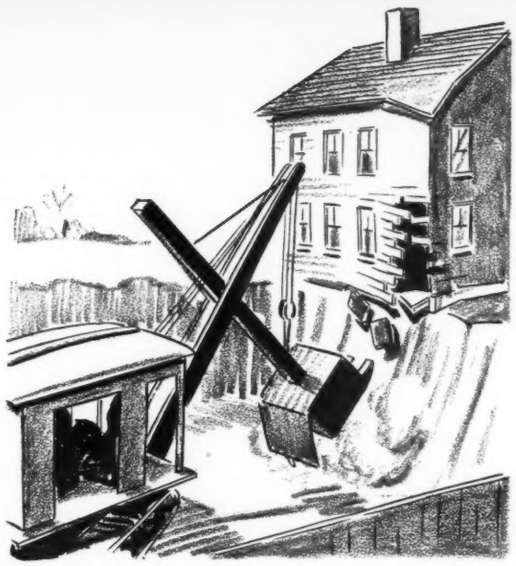

with specific hazards, the contractor can provide for any additional expense involved when he makes his bid. This can mean the difference between an economical and uneconomical job for the contractor.

A similar situation arises when plans and specifications are concerned with work done within property boundaries or right of ways, and the means of protecting adjoining property is not specified. When much of the actual work needed to complete the contract is not directly cited, an important question is whether or not funds necessary for protective work are included in the financing of the proposed job. When a contractor accepts a contract like this, he sometimes assumes responsibility for damage and must furnish a protective policy to the owner of adjoining property, naming the owner as the insured. A situation like this most frequently crops up in work involving underpinning of abutting structures where support is removed, in blasting and pile-driving work, where vibration damage to adjacent structures must be controlled, and similar operations.

On a recent excavation project, for instance, specifications did not relieve the contractor of responsibility for dry stone walls adjacent to the excavation and for houses located on questionable foundations nearby. In another case, the contractor was required to excavate through gravel that ran between two houses located close to each other. The buildings were so close together that no method of open-cut construction could be used without the probability of disturbing wall foundations.

Planning Bids

Additional construction features like these, if discovered in time, can be planned for so that their cost will be included in the bid. Discovered later, they can place the contractor in an awkward position, since he will probably not have allotted funds for the work. And, though he must accept responsibility for property damage, he will probably be unable to include an extra charge in his contract for the protective work. He will be forced either to undertake this work at his own expense or to do nothing, leaving the insurance company to assume responsibility for any damage.

Frequently, additional construction required to safeguard property and persons adds considerably to the cost of a job. Reflected in the contractor's bid, the increased cost can mean that his bid will be rejected. Rather than submit a non-competitive bid, many contractors, not conversant with the extent of their liability, submit bids excluding these items, taking refuge in their public liability insurance.

But throwing predictable losses like this onto the carrier is becoming increasingly difficult. Many insurance companies now examine their policies on a job basis and may exclude such items from the policy. If they are not excluded, the insurance company will either establish a rate which permits it to meet expected losses or will set up a price which permits it to take the neces-

(Continued on next page)

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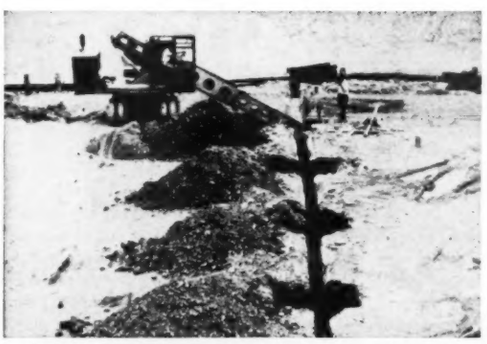

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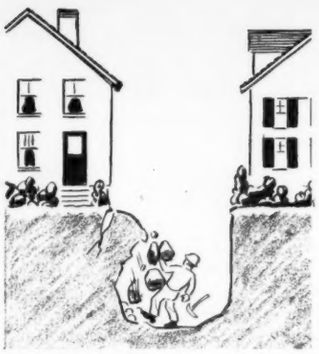
Insurance Is Part Of Construction Job

(*Continued from preceding page*)

ary steps which the contractor has omitted. This, in effect, makes the carrier responsible for parts of the job contract. Perhaps the most satisfactory solution to this problem, for both carriers and contractors, would be to have owners finance and specify proposed jobs in their entirety.

Approaching the insurance company in the preliminary stages of a job also assures the contractor that his insurance probably will not be refused. Often, contractors try to arrange for insurance at the last minute—sometimes a day or two before bidding is closed—and find that the carrier cannot grant coverage in so short a time. Longer periods of time are now required by carriers to compute rates and prepare coverage. This development is another source of friction since contractors, in most instances, must race against the clock to complete and submit a bid.



Time Factor

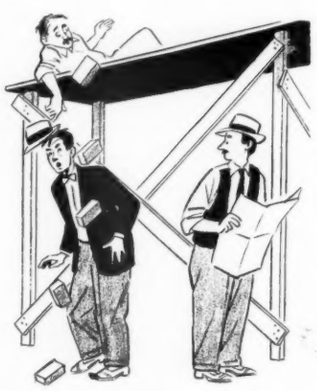
Ordinarily, two to four weeks—the time available to the contractor from the time bids are asked until they are closed—is needed by the carrier to prepare insurance. This is not too much time to allow the carrier to explore areas affecting its interests. If contractors protect their interests by taking several weeks to study and plan a job, a similar amount of time can be given the insurance company to examine the risks involved on the same job. For the contractor, the job may involve $250,000; for the carrier, the same job may involve accepting liability for a million dollars.

Early negotiations with the insurance company becomes even more important when reinsurance is necessary. Certain types of work, excluded from normal reinsurance treaties, must be arranged for individually. Moreover, a reinsurance firm will usually not accept coverage of items excluded from normal treaties without first conducting an investigation of their own. Because these firms have sustained heavy losses, they are extremely cautious. As a result, the reinsurance market is tight and its prices are very high. If reinsurance is placed with a foreign company—and Lloyds of London carries much coverage of this type—more time is required to complete negotiations.

While a contractor's appreciation of the time factor in insurance negotiations can lead to a better rapprochement between contractor and carrier, an understanding of liability insurance by the contractor can eliminate many other trouble spots. Save-harmless agreements and contingent or protective liability, often sources of misunderstanding in the insurance contract, differ widely. Adequate information on such agreements can be obtained early from the carrier.

Save-harmless Agreements

Save-harmless agreements made between contractor and owner hold the contractor responsible for damages for which another person is legally liable. This saves the owner from any suits arising out of actions of the contractor or his employees. However, since the agreements differ, it is not unusual to find that the contractor has assumed more obligations than he realizes. Often he saves the owner harmless from suits that might be attributable to the owner or his employees. The contractor who accepts responsibility for actions of persons not under his control may find himself responsible for the correctness of design, plan accuracy, patent infringements, and even Workmen's Compensation benefits for employees of the owner who may be injured on the site.

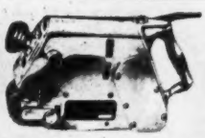


But though contractors seem willing to enter into such broad agreements with owners, they frequently fail to protect themselves with save-harmless agreements when they subcontract part of a job. Even when they secure such agreements, contractors often do not make certain that the agreements are insured to adequate limits by the subcontractor.

Also contained in the save-harmless agreements is a provision that the owner is not required to pay for damage to property that is under the care, custody, or control of the contractor, even though it is the owner himself who is responsible for the damage. Such an agreement thwarts the liability carrier who may have waived the care, custody, and control exclusion. If the carrier holds physical damage coverages, it is prevented from subrogating the claim against the owner who caused the damage.

Contingent Liability

Another trouble spot, contingent or protective liability, is designed mainly to protect against loss from damages caused by persons not employed by the contractor. Legal action arising under this type coverage is made easier by properly insured save-harmless agreements, but as already mentioned, contractors fail to secure these agreements with subcontractors in many cases. Complicating these coverages is the fact that legal considerations concerning them vary in different states. In one state, it is the general contractor's responsibility to see that all phases of the job be done in conformity with the state safety codes. In this case, a subcontractor's employee can institute action against the general contractor for injuries resulting from a violation of some provisions of the state



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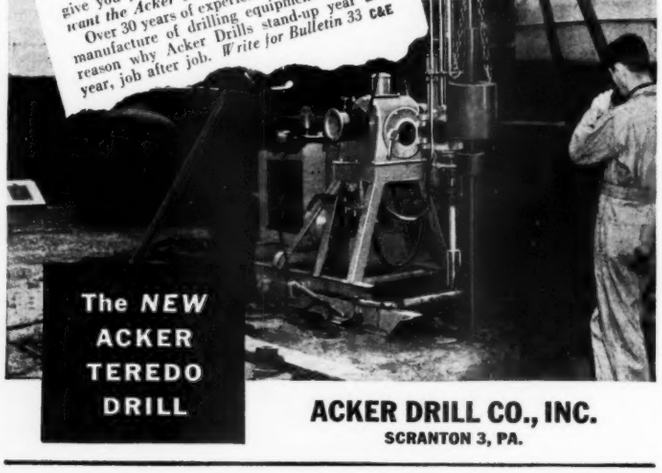
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CONTRACTORS AND ENGINEERS

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codes. This holds true even though the injury arose out of the subcontractor's operations. In another state, the contractor cannot delegate responsibility for explosives handling to anyone else, not even his subcontractor.

Improper consideration of these specific clauses in the liability contract often accounts for some of the unnecessary risk assumed by the carriers. To obviate these difficulties, companies generally require more time to examine jobs individually. However, there still remains a source of irritation between contractor and carrier—the increasing difficulty of obtaining blanket liability coverages, except in cases where low limits are specified. This is a development brought about by changing ideas about insurance by the legal profession, insurance companies, and laymen.

Broader Coverage

With contractors demanding a broader type coverage, carriers are being asked to waive subrogation rights and to abolish insurance clauses like "caused by accident". All this has the effect of eliminating the accident basis of liability insurance and cluttering up the contract with normal business risks. These innovations are being resisted by carriers who find themselves saddled with losses through risks they never intended to assume.

The waiving of the "care, custody, and control" exclusion is extremely troublesome. It was never intended that the liability policy would protect an owner against loss or damage to his own property. Obviously, an owner cannot sue himself. Other policies can take care of this risk, leaving the liability policy uncomplicated. Contractors, however, are demanding that this feature of the policy be waived in many cases.

One result of the use of such broad terminology is that there are frequent requests for coverage of losses that have nothing to do with chance happenings. In previous years, these risks would never have been considered insurable as they are concerned with damages resulting from unavoidable activities and from mistaken judgment. Fundamentally, the risk transferred to the insurance carrier is the risk of loss about which the contractor knows nothing. Obviously, if he did know about it, he would take care to prevent any loss. If the loss is inevitable, the carrier should exclude it from the policy. A variety of hazards opened up by these broadened policies makes the ordinary insurance-rate structure inadequate to price the risk or absorb losses.

Also influencing coverage and rates is the public's growing tendency to institute legal proceedings to collect claims, even when their claims have only a slim basis. While insurance companies maintain a policy of promptly paying persons entitled to damages, they oppose vigorously any fraudulent, exaggerated, or erroneous claims. In many instances, the cost of fighting such claims is greater than the amount that would have satisfied the claim in the first place.

Still another change in the attitude toward insurance is evident in the action of the courts. Frequently, court awards practically convert liability insurance into compensation insurance since the claimant has only to establish a casual relationship between the contractor's work and the loss. Legal views on blasting damage, the most conspicuous type of claim treated in this way, have been labeled the

majority rule and the minority rule. Both agree that where dirt, rocks, or debris have been thrown onto adjoining premises causing damage, proof of negligence is unnecessary. But the minority rule holds that, unless negligence is shown, no recovery can be made for damage if debris has not been thrown on adjoining property. The majority rule holds that recovery can be made for damage caused by concussion or vibration. Twenty-one states hold

(Concluded on next page)

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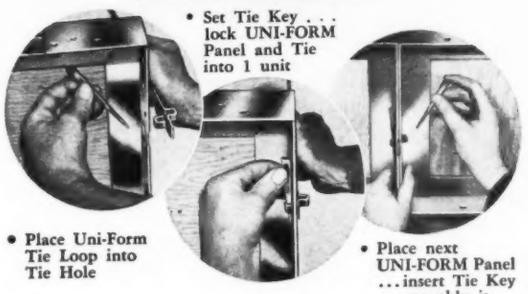

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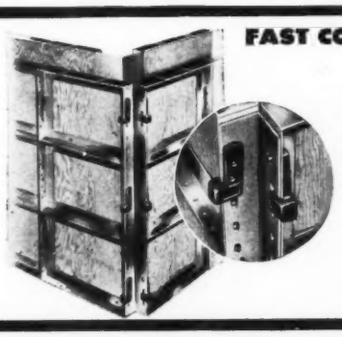
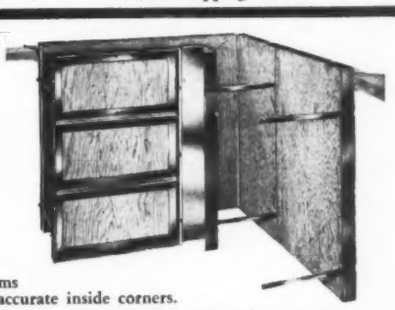


An Outside Corner Angle and Panel Loc Clamps form tight, accurate vertical corner . . . no additional tying.



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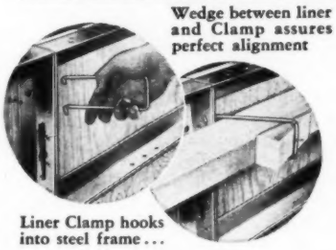

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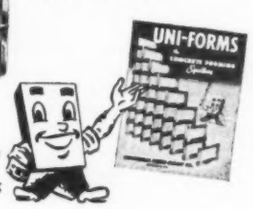

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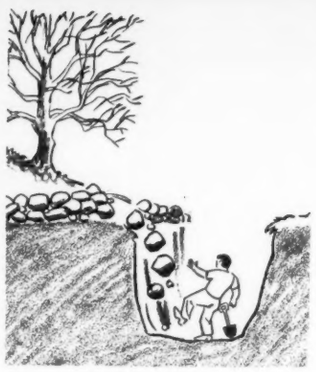
Insurance Is Part Of Construction Job

(Continued from preceding page)

to the majority rule, fifteen to the minority rule, while the remainder of them have rendered no clear-cut decision.

Controlling claim payments in such suits is difficult, since hardly a structure exists without some cracks and misalignments in floors, plaster walls, ceilings, and foundations, and it is difficult for the layman to determine whether these are caused by blasting, normal settlement, or shrinkage of materials. A similar case arises in work involving dewatering, since lowering the ground water table under buildings can cause foundations to settle, with subsequent damage to the structures. Claims in such cases, whether real,



imagined, or calculated, are difficult to defend.

Overcoming Difficulties

Realizing that insurance today is more than a mere incidental in the economic life of industry, contractors can do a number of things to reduce the problems faced by themselves and their carriers. First, they can notify the carrier as soon as possible when undertaking a job. Other points they can bear in mind are: (1) make sure the job plans are adequate and not impossible to carry out without increasing the probability of damage; (2) remain wary of agreements that will cause them to assume unreasonable liabilities; (3) study carefully agreements which may vary from state to state; (4) allow for predictable damage costs in their bid; and (5) procure save-harmless agreements from subcontractors.

By regarding their public liability contract only as a protection against loss originating in negligence, contractors can review carefully the limits of insurance requested from their carriers. They should not use their contract as a device to recover damages to their own property or to offset loss due to an error in estimating. And while not requesting carriers to accept liabilities not covered by the policy, they can aid carriers by assisting in the development of a uniform application of liability laws. Contractors should find it profitable to aid their carriers, for this puts carriers in a better position to help their clients.

THE END

Materials Choice Affected By Modern Plant Design

The present trend away from the "ancestral corporate home" and toward industrial plants which consist of the "minimum amount of building required to cover a mechanical process" is having a definite influence on construction materials and the trend appears to be away from materials which do not readily lend themselves to change or expansion.

What this means, according to Frank L. Whitney, chief engineer of Walter Kidde Constructors, Inc., New York, N. Y., engineers and builders, is that the modern factory building is being thought of as a housing for a layout of machines and operating personnel. The institutional quality has been replaced with a degree of flexibility, expandability, and even demountability that permits the building to grow and change as the manufacturing process itself grows and requirements alter.

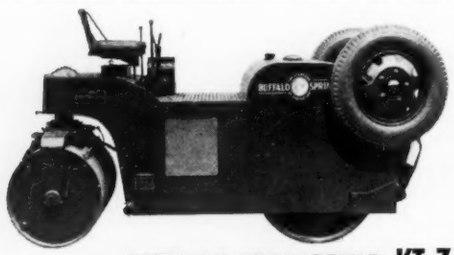
"The logical approach to this problem is a wall which can be economically expanded or revised as the production facility is expanded or revised," Mr. Whitney points out.

"To be sure, there is opposition to new materials, such as panels, and most of this opposition comes from plant owners who want masonry because they think it looks better and because it's a building material they've lived with all their lives," he says.

Mr. Whitney adds that another factor against a wider acceptance of panels is that "most of the panels on the market today were developed as cheap war and postwar substitute building materials.

"Although their use has been taking hold with some difficulty, it is easy to predict their acceptance, one reason being the development of newer and better panels which will demonstrate lower maintenance cost and furnish the desired flexibility and economies."

In 1915, an earthquake caused a Nevada mountain to grow 30 feet.



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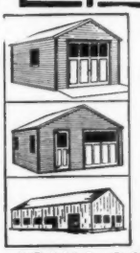

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Changing the conveyor incline angle and the angle of the belt idlers alters the surface pattern made by the ridges into a series of horizontal carrying ribs which retain water, so that there is an even distribution of moisture throughout the carried material. Adjusted this way, the belt handles wet-mixed concrete and similar moist materials on steeper inclines than can be negotiated on a smooth-surfaced belt.

For further information write to the company, or use the Request Card at page 18. Circle No. 255.

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The product is a carbon-black dispersion. It affords a uniform colloidal dispersion and stable tinctorial strength. Literature from the company describes the results of tests for compression and flexural strength that demonstrate the effect of the darkening agent on air entrainment and flow of mortar and concrete.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 256.

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O. F. Sieder, executive vice president and general manager of the American company, is president of the Canadian firm. E. A. Charlton, a native of Montreal, is vice president and general manager.

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DELAWARE—L. B. Smith, Inc., Camp Hill, Penna.

FLORIDA—Florida-Georgia Tractor Co., 2806 W. Beaver St., Jacksonville; 2418 State Rd., Lakeland; 3139 No. Miami Ave., Miami; 1400 S. Orange Blossom Trail, Orlando; New Quincy Highway, Tallahassee; 216 S. 12th St., Tampa.

GEORGIA—Tri-State, Inc., 880 Glenwood Ave. S.E., Atlanta 1; East 3rd Highway, Macon; Olive Rd., Augusta; 712-14 No. Washington St., Albany.

HAWAII—Grace Brothers, Ltd., 770 Ala Moana Road, Honolulu 10, Hawaii.

IDAHO—Intermountain Equipment Co., Broadway at Myrtle St., Boise; 210 No. 4th St., Pocatello.

ILLINOIS—Gil Boers Equipment Co., 7625 South Kedzie Ave., Chicago 29.
Euclid Sales & Service, Inc., St. Louis 10, Mo.

INDIANA—Gil Boers Equipment Co., Chicago 29.
Reid-Holcomb Co., 1815 Kentucky Ave., Indianapolis 21.

IOWA—Herman M. Brown Co., Des Moines, Cedar Rapids and Sioux City.
Fehrs Tractor & Equipment Co., Omaha 2, Neb.

KANSAS—The G. W. Van Keppel Co., Kansas City 8.

KENTUCKY—Euclid-Kentucky, Inc., 3900 Crittenden Drive, Louisville.

LOUISIANA—Euclid-Memphis Sales, Inc., Memphis 2.

MAINE—N. A. Burkitt, Inc., Route 1, R.F.D. 2, South Portland.

MARYLAND—Rish Equipment Co., Clarksburg, W. Va.
L. B. Smith, Inc., Camp Hill, Penna.

MASSACHUSETTS—Clark-Wilcox Co., 116 Western Ave., Boston 34.
The W. I. Clark Co., New Haven, Connecticut.

MICHIGAN—W. H. Anderson Co., Inc., 47 West Seven Mile Rd., Detroit 3.
The Euclid Road Machinery Co., Hibbing, Minn.

MINNESOTA—The Euclid Road Machinery Co., Highway 169 West, Hibbing.

MISSISSIPPI—Euclid-Memphis Sales, Inc., Memphis 2.

MISSOURI—Euclid Sales & Service, Inc., 5231 Manchester Ave., St. Louis 10.
The G. W. Van Keppel Co., 2461 Pennway, Kansas City 8.

MONTANA—Hall-Perry Machinery Co., P. O. Box 1367, Butte.

NEBRASKA—Colorado Builders' Supply Co., Denver.
Fehrs Tractor & Equipment Co., 1809-11 Cuming St., Omaha 2.

NEVADA—Geo. M. Philpott Co., San Francisco; Monrovia, California.
Foulger Equipment Co., Salt Lake City 8, Utah.

NEW HAMPSHIRE—Clark-Wilcox Co., Boston 34, Mass.

NEW JERSEY—L. B. Smith, Inc., Camp Hill, Penna.
Hubbard & Floyd, Inc., New York 51, N. Y.

NEW MEXICO—Lively Equipment Co., 2601 So. Fourth St., Albuquerque.

NEW YORK—Hubbard & Floyd, Inc., 151st St. & Gerard Ave., New York 51.
T. E. Potts Equipment Co., 2280 Sheridan Dr., Buffalo.
L. B. Smith, Inc., 357 W. Fayette St., Syracuse 2; 134 State St., Albany.

NORTH CAROLINA—Hampton Roads Tractor & Equipment Co., Norfolk, Virginia.
North Carolina Equipment Co., P. O. Box 880, Greensville; P. O. Box 1205, Charlotte; Sweeten Creek Rd., Asheville; P. O. Box 128, Guilford; P. O. Box 655, Wilmington.

NORTH DAKOTA—Northwestern Equip. Co., Box 152, Fargo.
Northwestern Equip. Co. of Minot, Box 335, Minot.

OHIO—The W. W. Williams Co., 835 Goodale Blvd., Columbus 8; 18301 Brookpark Rd., Cleveland 11; 914 Main St., Cincinnati 15; 1260 Conant St., Toledo (Maumee).

OKLAHOMA—Butler-Sparks Equipment Company, Oklahoma City and Tulsa.

OREGON—Intermountain Equipment Co., Boise, Idaho.
P. L. Crooks & Co., 2145 N.W. Pettygrove St., Portland.

PENNSYLVANIA—Atlas Equipment Corp., 635 Ridge Ave., Pittsburgh 12.
Standard Equipment Co., 152 Horton St., Wilkes-Barre; Hepburn & Lycoming Sts., Williamsport.
L. B. Smith, Inc., Camp Hill (Harrisburg); 29th & Montgomery Avenue, Philadelphia.

RHODE ISLAND—Clark-Wilcox Co., 2323 Pawtucket St., E. Providence.

SOUTH CAROLINA—Southern Equipment Sales Co., Sumter Highway, Columbia.

SOUTH DAKOTA—The Euclid Road Machinery Co., Hibbing, Minnesota.

TENNESSEE—Euclid-Memphis Sales, Inc., 185 E. Butler Ave., Memph's 2.
Power Equipment Co., 1218 Island Home Ave., Knoxville; 800 W. Manning St., Chattanooga; 121 Clay St., Kingsport.

TEXAS—The Euclid Road Machinery Co., 1007 Levee St., Dallas 2.
Lively Equipment Co., P. O. Box 1438, El Paso.

UTAH—Foulger Equipment Co., 1361 So. 2nd West, Salt Lake City 8.

VERMONT—Clark-Wilcox Co., Boston 34, Mass.

VIRGINIA—Hampton Roads Tractor & Equipment Co., W. 39th and Killam Ave., Norfolk.
Rish Equipment Co., 1601 Chamberlayne Ave., Richmond 10; 405 Center Ave. N.W., Roanoke 7.

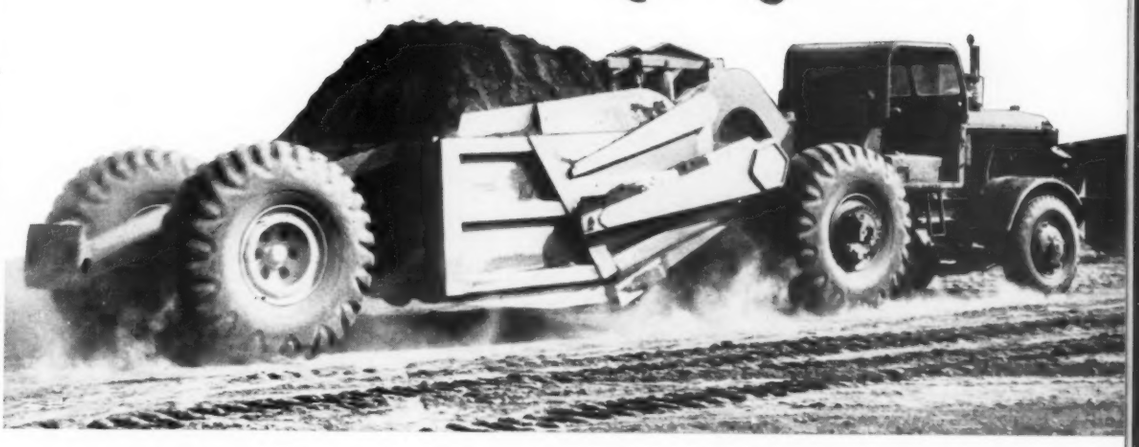
WASHINGTON—Philpott Equipment Co., 573 Dexter Horton Building, Seattle 4, Washington.
P. L. Crooks & Co., Portland, Oregon.
Intermountain Equipment Co., L. 611 Sprague Ave., Spokane 5.

WEST VIRGINIA—Atlas Equipment Corp., Pittsburgh.
Rish Equipment Co., Kanawha Blvd., Charleston 22; East on U.S. 50, Clarksburg; P.O. Box 269, Bluefield.
L. B. Smith, Inc., Philadelphia, Penna.

WISCONSIN—Cunningham-Ortmayer Company, Milwaukee 46, Eau Claire and Green Bay.

WYOMING—Colorado Builders' Supply Co., Denver.

How big is a scraper payload?



Because there are several ways to figure equipment capacity, it's mighty important that payload ratings are compared on the same basis. For example, if you use the struck figure for one unit and the heaped capacity for others in making a production estimate, the result can mean an unprofitable bid and higher costs per yard moved.

And heaped capacity ratings can be misleading too, because just how high is a heap? Some manufacturers use a heaped figure based on a 1:1 slope while others prefer a more conservative and practical rating of 3:1 slope. Heaped loads can vary by several cubic yards depending on the material, method of loading and hauling conditions. For example, the Euclid Scraper carries 15.5 cu. yds. with a level load, 18 cu. yds. with load heaped to 3:1 slope and 21 cu. yds. at 1:1 slope.

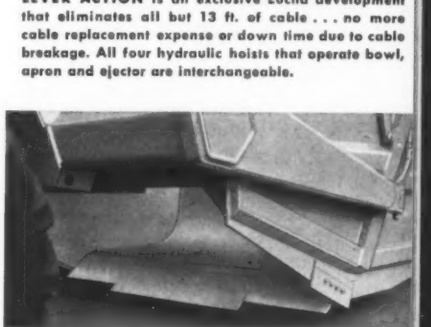
When you're in the market for scrapers to supplement or replace your present equipment, be sure to check struck capacity and other specifications such as engine horsepower, loaded travel speed, scraper operating controls and hourly cost and production data.

How big is a scraper payload? You can't tell how much dirt is in the bowl just by looking—it's the pounds of pay dirt that tell the story. By actual scale weight, "Eucs" carry more pounds of payload than scrapers of comparable size because the design of the low, wide bowl provides good loading action and exceptional compaction.

You'll find there are good reasons why "Euc" scrapers outperform all others of comparable size. A Euclid distributor near you will be glad to supply all the facts—without any obligation, of course.

The EUCLID ROAD MACHINERY Co., Cleveland 17, Ohio

LEVER ACTION is an exclusive Euclid development that eliminates all but 13 ft. of cable . . . no more cable replacement expense or down time due to cable breakage. All four hydraulic hoists that operate bowl, apron and ejector are interchangeable.



CUTTING BLADE consists of 4 sections, each interchangeable and reversible. This Euclid design permits easy adjustment to provide blade arrangements that are most efficient for loading any type of material from loose sand and top soil to heavy clay and shale.

Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE

Alaskan Barracks Secured Against Frost-Heave Action

A Wagnermobile concrete tower and a Gar-Bro Power-Cart combine to carry out a pour.
Ray Day Photo

A 500-MAN BARRACKS building, designed for permanent housing at Elmendorf Air Force Base near Anchorage, Alaska, is being hurried toward completion before snows come this winter. Last year, frost heaves moved its footings and walls as much as 3½ inches. By completing the barracks before the cold weather sets in, the basement can be heated to keep the earth from freezing around and underneath the concrete.

There has been a minor amount of consolidation settlement with the exterior of the building now almost finished. The concrete acts as a load on the ground below, causing the settlement to be evenly distributed.

The project is a $2,127,000 structure, one of the largest residence buildings to be built for the armed forces. The Corps of Engineers contract for its construction is held by the Seattle-Juneau firm of Valle-Sommers, Inc. Despite the frost movement and an untimely delay in awarding the contract, work is proceeding rapidly, and project officials expect to have the building's exterior completed by the time the snow begins to fall. Interior work can then go forward through the winter.

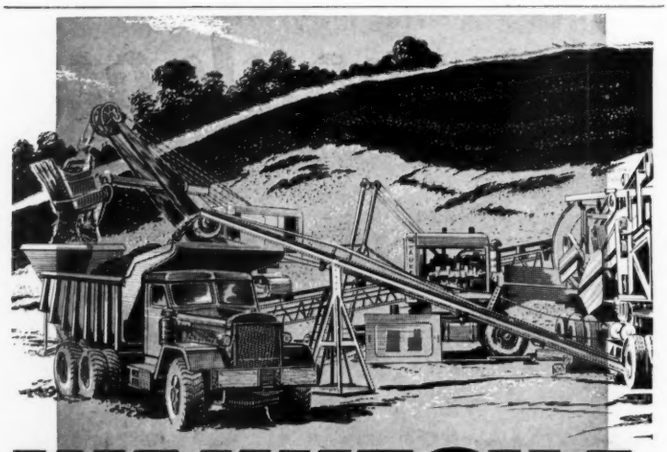
Award Delay Causes Move

The unfortunate delay in awarding the contract was in a large measure responsible for the frost-heave mishap. The big building had been carefully designed with the possibility of just such an occurrence in mind, since engineers knew the glacial clay at the site was especially susceptible to frost. By January, 1952, the plans were completed and the job was ready for bids in the usual Alaskan manner, which gives the successful contractor time to buy materials, mobilize equipment, and arrange for crews by the time the April construction season opens.

But there was a mixup in appropriations somewhere along the line, and funds for the job were delayed. When the contract was finally awarded on August 4, 1952, almost an entire construction season had been lost.

In an effort to get the much-needed building under way in spite of this delay, Valle-Sommers, Inc., moved in and worked as late as possible the first year. When the winter freezes hit the job, most of the heavy reinforced-concrete footings, a few of the walls, and one basement slab pour were in place. The footings and the half-finished basement walls were exposed to the weather throughout the winter. The basement slab was partly protected by a lumber pile and plywood.

Movement of the concrete became visible to surveyors shortly after the spring thaw, when frost heaves appeared. Measurements were made, and the concrete was examined for signs of cracks or other failure. When surveys showed that footings had moved up to 3½ inches and



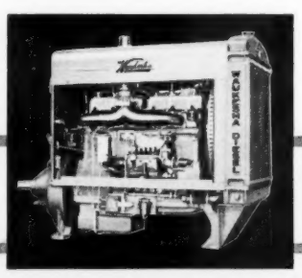
WAUKESHA

145 Series and 148 Series

POWER UNITS

145-GKU	779 cu. in.	Medium Speed, Gasoline (Standard Crankshaft)	167 max. hp
145-GKBU	779 cu. in.	High Speed, Gasoline (Counterbalanced Shaft)	178 max. hp
145-GZBU	817 cu. in.	High Speed, Gasoline (Counterbalanced Shaft)	185 max. hp
148-DKU	779 cu. in.	Normal Diesel (Standard Crankshaft)	165 max. hp
148-DKBU	779 cu. in.	Normal Diesel (Counterbalanced Shaft)	181 max. hp
148-DKBSU	779 cu. in.	Turbocharged Diesel (Counterbalanced Shaft)	250 max. hp

• Heavy duty! That's what the 145 and 148 Series power units are for . . . and what they do. Here's what they have—every detail built for rough and tumble service . . . crankcase-cylinder block is a deep, thick-wall casting . . . massive, drop-forged, 7-bearing hardened crankshaft . . . pressured oil to every internal bearing, gear and shaft . . . dual spring overhead valves . . . cam ground, heavy-duty pistons . . . full length water jacket, with removable liners . . . and other modern features—for clean burning, high economy, lively performance and long life. Send for Bulletins.



148-DKU DIESEL UNIT
6-cylinder, 5¼-inch x 6-inch, 779 cubic inches, 165 hp @ 1600 rpm with standard crankshaft.

224

WAUKESHA MOTOR COMPANY, WAUKESHA, WIS.
NEW YORK • TULSA • LOS ANGELES

WELLMAN *Williams Type*

PERFORATED DRAGLINE BUCKET

speeds the wet jobs

• You get big loads fast with this Wellman Perforated Dragline Bucket because excess water goes out while gravel stays in on jobs such as illustrated.

Built of special alloy steel—all welded for strength plus light weight. You can work faster with less maintenance with Wellman dragline buckets.

Want Facts?
Write for free descriptive bulletins.

Dragline, Clamshell, Custom-Built Buckets, Stone and Wood Grabs.

THE WELLMAN ENGINEERING COMPANY
7000 Central Avenue
Cleveland 4, Ohio

Steam thaws ground, restores original alignment of building after it shifts 3½ inches in freeze-up at Alaskan air base

walls had deflected up to 2½ inches without apparent damage to the concrete, Operation Thaw was decided upon.

A ring of ¾-inch steam pipes was installed around the concrete work, and the steam was injected to a point about 6 feet below the low point of each footing. As the ground thawed, footings and walls began to move back to their normal positions. After the entire area had been thawed out, the building was back on its old alignment. There was no damage to the footings, and cracks in the basement walls were negligible. Construction work was then resumed on the original plans.

Building Design

Because it will be used for unrevealed special purposes, the building is a modification of the standard 500-man barracks in common use at the Elmendorf base. Other 500-man barracks previously constructed were connected to the main steam supply and other utilities. This building is more self-contained. It has its own steam-generating equipment for heat and its own garage, cafeteria, and barber shop. The building is capable of housing 500 men the year round.

Built of reinforced-concrete framing throughout, the building has three stories and a full basement. Fill-in walls are of cement-block construction, and the floors are of concrete. The barracks easily conform to the "austere" Alaskan housing design of the past several years.

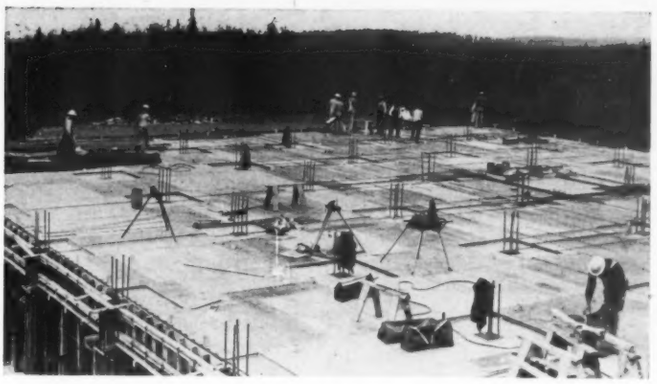
The building is 400 feet long, 46 feet wide, and has a wing, 90 x 86 feet, which will be used for housing some of the built-in utilities. In general, the exterior walls are 9½ inches thick; the floors, 6 inches; and the cement block filler walls, 8 inches. A built-up roof over the flat concrete one will serve to make the top completely watertight. The typical 500-man barracks was designed with a pitched roof, but the Valle-Sommers version has a flat roof.

Excavation Subbed

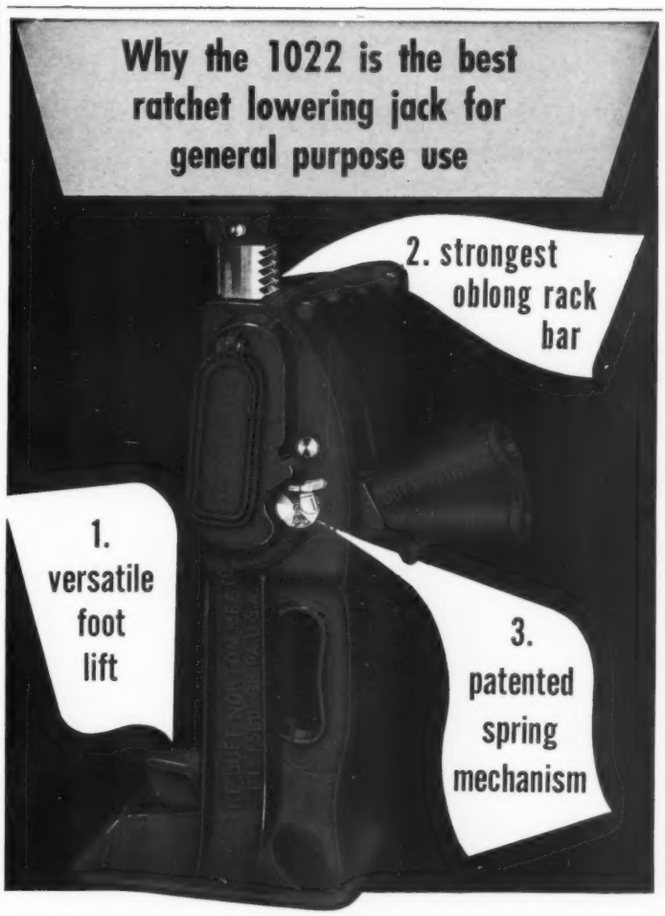
To get work under way as soon as the contract was let, Valle-Sommers went to the Mt. McKinley Excavating Co., Anchorage, with its excavation problem. Mt. McKinley Excavating Co., an established specialty firm in Anchorage, had the equipment in stock for handling the excavation. The dirt job consisted basically of removing a 400 x 46-foot block of earth to form the basement and of excavating below that for the concrete footings which support the big building. Material was mostly glacial clay, with a few pockets of round glacial gravel in evidence.

Two machines were quickly assigned to the job. A ¾-yard Lorain power shovel with four dump trucks of assorted makes moved much of the excavation, and an Allis-Chal-

(Continued on next page)



Carpenters and electricians place forms and conduits for one of the floors in the 500-man barracks building being erected at the Elmendorf Air Force Base near Anchorage, Alaska. *Ray Day Photo*


Why the 1022 is the best ratchet lowering jack for general purpose use
2. strongest oblong rack bar
1. versatile foot lift
3. patented spring mechanism

This rugged 10-ton Jack is one of the most popular in the Duff-Norton line for average lifting, lowering, and pushing jobs because (1) It can use its foot as well as its head; (2) It has the strongest rack bar of any jack of its weight and capacity; (3) It is equipped with the exclusive, patented spring mechanism which assures absolute safety and longer trouble-free service life.

If you are not using the famous 1022 in your shop, get the complete specifications on this and the many other Duff-Norton Jacks. Call your local distributor or write the world's oldest and largest manufacturer of lifting jacks. Ask for catalog 203S, The Duff-Norton Manufacturing Company, P. O. Box 1889, Pittsburgh 30, Pa. Canadian plant—Toronto 6, Ontario.

DUFF-NORTON

"Giving Industry A Lift Since 1883" **Jacks**

Proven Dependability

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VULCAN IRON WORKS CHICAGO·U·S·A

for over 100 years

Manufacturers of Pile Driving Hammers and Pile Extractors

VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

Barracks Secured Against Frost Heaves

(Continued from preceding page)

mers HD-5 tractor with a front-end loader moved the remainder and cleaned up around the shovel. There was a disposal area nearby for the material, and part was used for fill to fit in with the general landscape plan. By starting the excavation at one end of the building and digging it out completely, a small area was soon ready for concrete footings.

All-Wood Forming Used

The concrete forming job was sufficiently typical so that panels could, in most cases, be re-used from floor to floor. Because of the necessity for good-looking exterior and interior concrete, practically all exposed concrete faces had to be formed against plywood. Although one small new plywood mill had recently been built at Juneau, the plywood was shipped from Seattle to make certain of a dependable supply. Rough lumber—which included 2 x 6's for wales and 4 x 4's for shoring—was purchased locally, since Alaskan lumber mills produce considerable amounts of Sitka spruce and hemlock timber.

DeWalt power saws and other smaller equipment were established at the job site. Form panels consisted of plywood facing, 2 x 4 or 2 x 6 studs—usually on 15-inch centers—and 2 x 6 wales. The form panels were fastened together during a pour by Richmond patented form ties. It was usually possible to strip the side-wall form panels and move them up to the next story, but considerable rebuilding of forms was necessary on each floor pour. Floor panels were supported on 4 x 4 timber shores with T-bearing caps at the tops and wedges at the bottom for proper adjustment. The forming job is comparable and quite similar to building construction of this type on defense bases in the United States.

As a side line, the carpenters also built some concrete-fence post forms to precast the supports for a security fence that will surround the place.

Concrete Mixed Locally

The concrete work is typical of all construction of that nature in the Corps of Engineers jurisdictional area around the Elmendorf and Fort Richardson areas. Specifications called for concrete to be furnished by the Corps of Engineers.

The concrete plant consists of a Cedarapids crushing and screening plant, set up adjacent to a Noble full automatic concrete batching plant. The site is in the center of an unlimited glacial gravel pit, in rock so alkali-free that Type 1 cement could be used regularly. The aggregate and concrete plants are run for the Corps of Engineers under a separate contract by Otto B. Ashbach & Sons, Inc., St. Paul, Minn., and delivery of the mixed concrete is made by Maxon Dumpcrete bodies on Ford trucks.

Bulk cement is being used for the mix, causing a long, difficult supply problem. Bulk cement is being supplied jointly by the Permanente Cement Co., Oakland, Calif., and Superior Portland Cement Co., Inc., Seattle, Wash. Permanente hauls bulk cement by covered barge to Anchorage, where the material is unloaded and trucked to the plant. Superior hauls to the port of Seward

Cleaver-Brooks EQUIPMENT
for Steam . . . Hot Water . . . Heat

SELF-CONTAINED STEAM BOILERS

125 HP Model LFM-12 (trailer mounted)

MOBILE — PORTABLE

Portable steam for Asphalt, Ready or Hot-Mix Plants, Rock Asphalt Heating, Aggregate Drying Storage & Tank-Car Heating, Pile Driving, Winter Concrete Curing. Trailer-mounted for easy towing. Skid-mounted for installation on your truck or trailer. A.S.M.E. Code constructed. All-season usefulness, all-weather protected.

SPECIFICATIONS

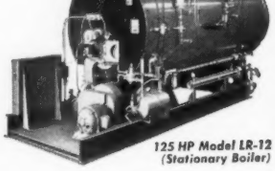
MODEL	LFM-8	LFM-12
Approx. Boiler horsepower	80	125
Approx. rated capacity lbs. of steam per hour (212° F)	2760	4300
Weight of normal water capacity lbs.	3770	4860
Capacity of Fuel Oil Tank, gals.	85	115
Capacity of Gasoline Tank, gals.	5	30
SKID MOUNTED		
Overall length	14' 8"	16' 4"
Overall width	5' 6"	6' 0"
Overall height	6' 6"	6' 10"
Approx. shipping weight, lbs.	10,000	14,410

TRAILER MOUNTED (dual wheels)	LFM-8	LFM-12
Overall length	17' 9"	19' 10"
Overall width	8' 0"	7' 11"
Overall height	7' 9"	8' 6"

TRAILER MOUNTED (tandem wheels)	LFM-8	LFM-12
Overall length	17' 9"	19' 10"
Overall width	7' 0"	7' 6"
Overall height	7' 9"	8' 5"
Approx. shipping weight, lbs.	14,000	18,000

STATIONARY

Shipped as a complete, ready-to-operate self-contained unit. For Asphalt Plants, Oil Bulk Stations, Ready-Mix Concrete and Concrete Block and Cast Products Curing Plants. Finished and tested under actual loads. Approved safety devices. Designed to A.S.M.E. Code. Hartford Insurance inspected and approved. Fast steaming, 80% efficiency —full load down to 30% rating. Low-fire start saves fuel. Burns oil, gas or combination oil or gas. Sizes: 15 to 500 HP; 15 to 250 psi.



125 HP Model LR-12 (Stationary Boiler)

SPECIFICATIONS

Boiler Horsepower—125

Lbs. Steam per hour from and at 212° F.—4,300

BTU Output, 1,000 per hour —4,180

EDR Steam Gross—17,370

EDR Steam Net, HP and A.C.C.—17,300

Unit has self-contained fuel and gasoline tanks.

PORTABLE PUMPING BOOSTER

Withdraws pumpable bitumens from tank cars. Heats by direct firing, recirculates, then delivers directly to distributor. Raises temperature 50° F. per hour. Larger, electric motor-driven unit available for stationary use.

SPECIFICATIONS

NO. 1A PUMPING BOOSTER
Operating burner at full cap. and pumping material:

Approx. 300 G.P.M. temperature rise	25- 35° F.
Approx. 180 G.P.M. temperature rise	45- 55° F.
Approx. 100 G.P.M. temperature rise	85- 95° F.
Approx. 50 G.P.M. temperature rise	170-180° F.

Heats 10,000 gal. car 35-45° F. per hour.

NO. 2AA PUMPING BOOSTER
Operating burner at full cap. and pumping material:

Approx. 350 G.P.M. temperature rise	45- 55° F.
Approx. 208 G.P.M. temperature rise	80- 90° F.
Approx. 112 G.P.M. temperature rise	110-120° F.
Approx. 60 G.P.M. temperature rise	200-210° F.

Heats 10,000-gal. car 55-65° F. per hour.

"DEUCE" Combination TANK-CAR HEATER AND PUMPING BOOSTER

"Deuce" pre-heats to pumpable consistency, circulates and heats to application temperature — then pumps and loads distributor. A.S.M.E. Code constructed. Four-pass boiler, equipped with condensate pump, is mounted on same frame with direct-fired booster and asphalt pump.

"Deuce"—15 HP, 125 lb. W.P. oil-fired boiler and 1A Booster

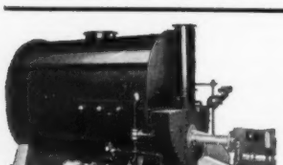
Operating Burner at Full Capacity and Pumping Materials

Approx. 300 G.P.M. Temperature rise	25- 35° F.
Approx. 180 G.P.M. Temperature rise	45- 55° F.
Approx. 100 G.P.M. Temperature rise	85- 95° F.
Approx. 50 G.P.M. Temperature rise	170-180° F.

Heats 10,000 gallon car 35-45° F. per hour.

SPECIFICATIONS

	Skid	Trailer
Overall length, in.	159	185
Overall width, in.	66	81
Overall height, in.	71	90
Shipping weight, lbs.	6350	7080



Available in 2 sizes, skid-mounted

PEAK-TEMP OIL BOOSTER

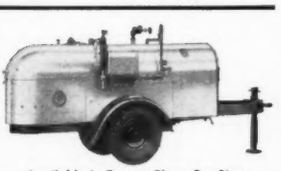
Heavy-duty, fully automatic booster uses high-flash-point oil as heat transfer medium to raise and maintain bituminous and heavy viscous materials to application temperatures. Fired by pressure-atomizing oil burner. Self-contained—ready for service line hookup.

SPECIFICATIONS

Model	1201	1801
Overall length, in.	145	169
Overall width, in.	66	66
Overall height, in.	78	96
Shipping weight, lbs. (approx.)	6100	7000
Burner Capacity (Maximum)	12 gph	18 gph

MOBILE TANK-CAR HEATER

Compact oil-fired boiler for operation at 125 lbs. W.P. Four-pass, down-draft, A.S.M.E. Code constructed. Uses fuel oil to and including Commercial No. 2. Has other year-round applications: Steam cleaning, culvert thawing, etc.



Available in Two or Three Car Sizes

SPECIFICATIONS

	Trailer	Skid
TWO-CAR HEATER, 28 BHP		
Overall length, in.	162	126
Overall width, in.	60¾	36½
Overall height, in.	69	53¼
Shipping weight, lbs.	4000	3900
THREE-CAR HEATER, 42 BHP		
Overall length, in.	164	127½
Overall width, in.	67	42
Overall height, in.	79½	59¼
Shipping weight, lbs.	4800	4500

Write for Catalogs and Complete Details

CLEAVER-BROOKS COMPANY

DEPT. M—397 E. KEEFE AVE.
MILWAUKEE 12, WISCONSIN

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CANADA—Mussens Canada Ltd., Church St., New Brunswick, Fredericton; Coleman Machinery Co., Ltd., 101 Upper Water St., Nova Scotia, Halifax; Mussens Canada, Ltd., 65 Colborne St., Montreal 3; Ontario Equipment & Supply, Ltd., 111 Merton St., Toronto, Ontario; Frost Machinery Co., Ltd., 971 Erin St., Winnipeg, Manitoba; International Agencies & Machinery Co., 2315 Cambie St., Vancouver, B. C.; Mussens Canada, Ltd., Charest Blvd., Quebec.

by the same method and transfers the material by rail to the batch plant.

The concrete mix uses 1½-inch-minus aggregates, 5½ sacks of cement per cubic yard, and Darex air-entraining agent. The concrete is mixed at the batch plant by two Koehring tilting mixers, dumped to the Maxon Dumpcretes, and hauled out to the building site.

Valle-Sommers has used the Wagner Mixermobile method entirely for its concrete placement. Wagnermobile towers, high enough to reach the concrete placing point, were brought in early in the job. The Dumpcretes deposit the fresh concrete into 1-yard buckets on these towers; the buckets are raised to pour level and dumped to a Gar-Bro transfer hopper. For all floor and center-wall pours, a system of wood platform runways with three Gar-Bro power carts is being used. In a few places, the Wagner tower has been able to dump directly to the pour location. Vibration is by Mall gasoline-driven machines, and curing is either by paper and water, or by Sealtex membrane.

When the spectacular eruption of Mt. Spurr took place during July, 1953, Valle-Sommers was busy placing one of the second-floor concrete slabs. Within a matter of an hour or so, the air was thick with flying dust, and what had been a fair day changed to the blackest kind of night. Lights were brought out. The pour was stopped. Cement finishers worked fast to finish the slab as dust fell like snow, and as soon as they finished, paper and water were applied to protect the concrete. Strangely enough, there was little damage. The only thing noticeable is a minor amount of scaling.

By the winter of this year, concrete work on the new building is expected to be finished, and windows will be in. Stoves can then be installed for temporary heat, and a small force of carpenters, plumbers, steamfitters, and other utility men can work through the winter completing much of the interior work. Although the scheduled completion date is June 30, 1954, company officials expect to have the building finished ahead of schedule.

All summer, Corps of Engineers surveyors have continued making check shots and measurements of the parts affected last winter by the frost, but there has been no further movement once the ground thawed and the footings settled back to normal. As the building rose and the concrete was imposed as a load on the ground below, a minor amount of consolidation settlement took place, but it has been evenly distributed.

Personnel

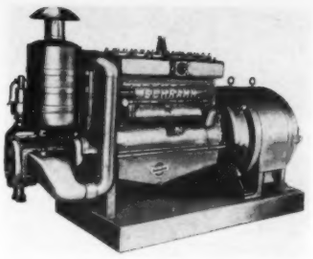
Valle-Sommers operations are under the general supervision of G. H. Ongman, general superintendent. Corps of Engineers inspections and engineering are administered by Resident Engineer Lt. Col. R. E. Hisle, under the general supervision of Colonel Louis H. Foote, district engineer. THE END

You can save a life by ordering a $10 CARE food package for a needy person overseas. Send to CARE, 20 Broad St., New York 5, N. Y.

Portable Compressor Is Largest in Line

■ A new and larger industrial compressor has been added to the line made by Schramm, Inc., West Chester, Pa. The Model 600 Super Unistage compressor provides 600 cfm of air at 100 psi.

Powered by a 150-hp induction motor, the new unit has 43 per cent greater capacity than the largest compressor previously manufactured by the company. The unit is vibrationless, can be installed without an expensive foundation, and can be moved from one location to another on a fork truck. It is available with



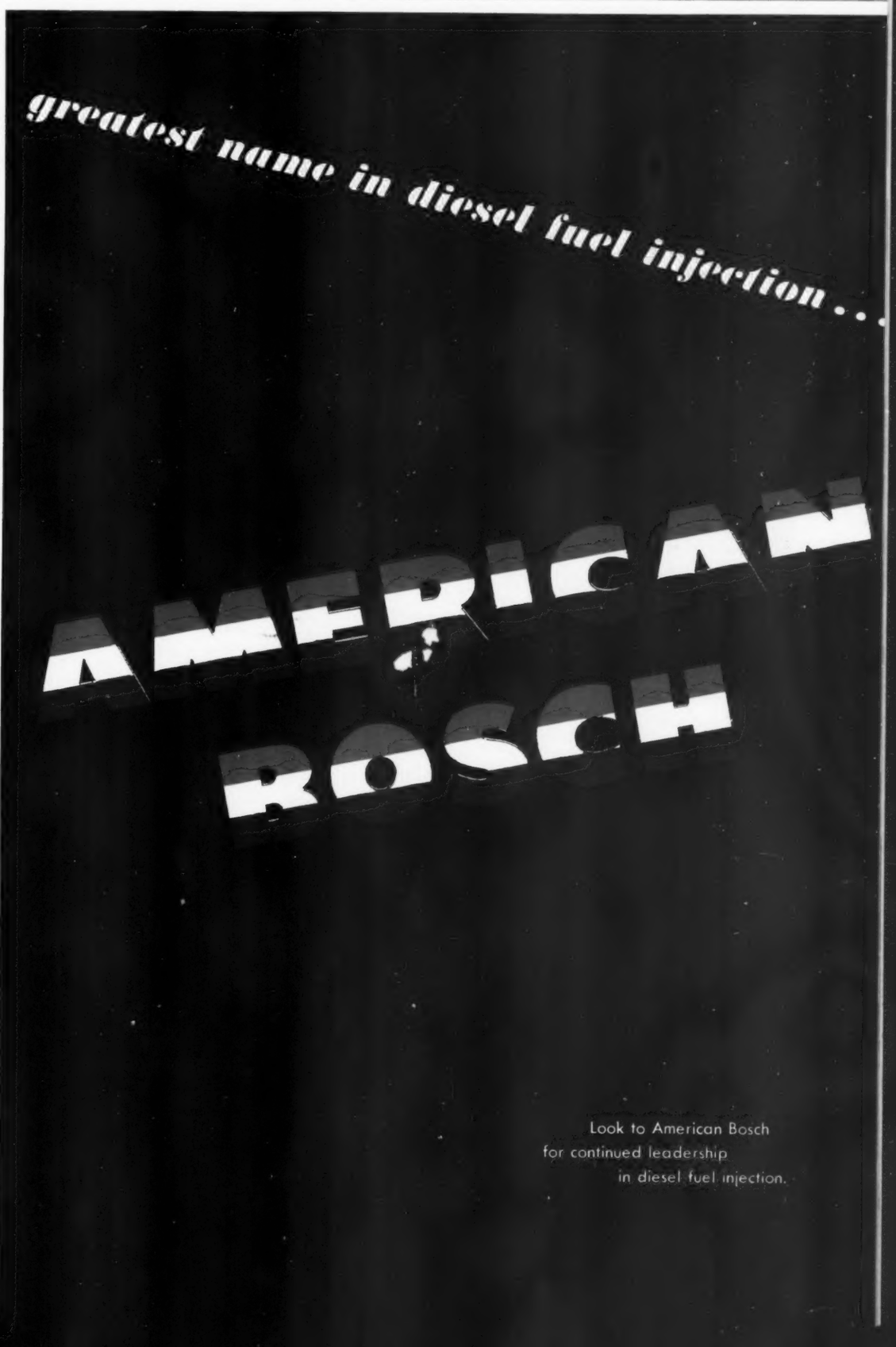
running-water cooling, or with a built-in cooling unit with or without a hood.

For further information write to the company, or use the Request Card at page 18. Circle No. 245.

Installing Sheet Copper

■ Recommendations for the proper installation of sheet copper in new construction or in the repair of old work are given in literature from Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y. A copy of specifications for sheet metal work based on the recommendations is available with the booklet. Topics covered include basic principles, design, installation procedure, and mechanical properties.

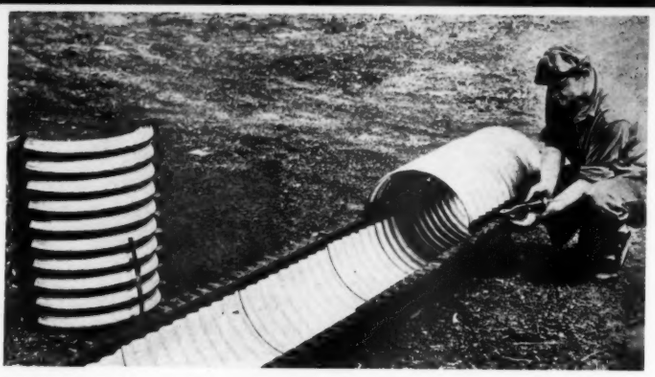
To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 266.



Nestable Culvert Pipe Of Corrugated Metal

■ A nestable-type culvert pipe made of corrugated galvanized sheets curved to form half-circle sections is available from the Wheeling Corrugating Co., Wheeling, W. Va. The pipe is made in short sections, 25½ inches wide, for ease in handling. Several sections are nested together with square-head bolts and hexagonal nuts furnished with the pipe in a separate carton.

The only tool necessary to lay the Wheeling pipe is a structural wrench. The longitudinal edges of each section are formed with flanges in which slotted holes are provided for bolting the sections together. The sheets are corrugated ½ inch deep with a 2.66-inch spread from center to center of corrugations. Sections are 25½ inches in length and every two sections, when assembled, make a 24-inch length of full circle pipe from center to center of lapped corrugations.



The Wheeling nestable corrugated culvert pipe features easy field assembly.

The pipe is available in either copper, steel, or pure iron with a galvanized coating of 2 ounces per square foot. The flanges are painted, after forming, with black acid-proof paint. The usual practice is to lay the sections starting at the down-stream end and then lap each section one corrugation over the previously placed section. The top halves are started at the up-stream end, with the first section extended 2 or more corrugations so that the circumferential laps will not be directly opposite the ones on the bottom half sections.

For further information write to the company, or use the Request Card at page 18. Circle No. 190.

Porter Co. Promotes Dow

G. N. Dow has been appointed Chicago district sales manager for the Leschen Wire Rope Division of H. K. Porter Co., Inc., Pittsburgh, Pa.

The Chicago sales district includes northern Illinois, Iowa, Wisconsin, northern Indiana, Minnesota, and Michigan.

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Save those Damaged $2000—$3000 Tires!

● NEW PATENTED PROCESS MAKES REPAIRS *Stronger Than New Tires*

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The P. M. method of applying bitumen is *not* metered by the bituminous pump, nor is the amount of discharge measured in relation to the pump revolutions. Normal wear of the pump and occasional, unavoidable nozzle clogging never affect the application rate. Here again, Pressure Metering *makes the difference* . . . the rate is automatically maintained by Rosco's P. M. system.

It is this Pressure Metering Master Valve, the "heart" of Rosco Distributors, that gives you this built-in control of pressure which is the only accurate method of obtaining precise bituminous application. This is the valve that also directs the flow of material for all of the Rosco Distributor functions.

Make the difference pay off. Let your Rosco dealer show you how. Write the factory for descriptive bulletins with specifications of Distributors with P. M.

•

ROSCO MANUFACTURING CO.

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Oil-Heat Exchanger And Oil Clarifier

■ A combined oil-heat exchanger and oil clarifier offered as one integral unit is announced by the J-B-Engineering Co., Inc., 9949 Commerce Ave., Tujunga, Calif. The Model J-B-99 is completely finned and presents about 1,900 square inches for the dissipation of excessive temperatures found in the body of lubricating oil. The rate of heat exchange is about 5,000 Btu per square foot exposed at room temperature with no air circulation.

The unit consists of a replaceable filter element of a white fibrous medium, said to filter particles from 2 to 4 microns in size. The medium is wound in convolutions on a steel core to give, in effect, many laminations of media.

The exchanger decreases the difference in temperature between the cooling system and the crank-case oil, thus narrowing the difference in expansion between water-cooled and oil-bathed parts. The use of the combined oil-heat exchanger and oil clarifier is said to provide constant lubricant viscosity under almost all operating conditions.

The unit is made of special aluminum-alloy casting. It is equipped with a by-pass valve for installation in both full-flow and by-pass circulatory systems.

For further information write to the company or use the Request Card at page 18. Circle No. 185.

Bulletin on Compressors

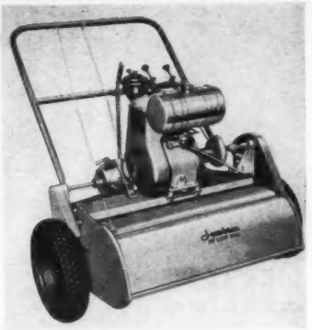
■ A new bulletin describes the Models 160 and 210 Super Chief portable compressors, made by the Davey Compressor Co., N. Water St., Kent, Ohio. The literature contains specifications and illustrations of two-wheel, four-wheel, and skid units.

The two-stage design of the compressors features two low-pressure cylinders and one high-pressure cylinder to eliminate vibration. After the initial 30-psi compression in the low-pressure cylinder, the air is cooled to about the original intake temperature before entering the high-pressure cylinder. There it is further compressed to 100 or 125 psi.

To obtain Bulletin E-252 write to the company, or use the Request Card at page 18. Circle No. 295.

Chandler Joins Lufkin

Donald Chandler has joined the sales force of The Lufkin Rule Co., Saginaw, Mich., manufacturer of rules, tapes, and precision tools. He will be located in the Chicago area. Mr. Chandler is a graduate of Northwestern University.



Leaf Pulverizer

■ A self-propelled machine picks up leaves, pulverizes them, and returns the particles to the soil. It is mounted on pneumatic tires and is powered by a 6-hp 4-cycle gasoline engine. The unit, which has separate mill and traction clutches with controls on the handle, runs at 2½ miles per hour.

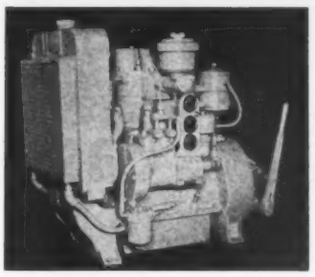
The manufacturer states that sticks and stones are ejected by the machine without damaging it.

For further information write to the Jacobsen Mfg. Co., Racine, Wis., or use the Request Card at page 18. Circle No. 296.

Benson for Rubarite

Jewell R. Benson has been appointed chief engineer of Rubarite, Inc., Magnet Cove, Ark., a new company which produces a synthetic rubber product for use in rubberized asphalt for paving and other purposes. Mr. Benson will operate from the company's western office in Denver, Colo.

Rubarite, Inc., is owned jointly by the Goodyear Tire & Rubber Co., The National Lead Co., and Bird & Son, Inc.



The new Sheppard Model 17, a compact two-cylinder diesel engine, develops 20 hp at 2,000 rpm. The engine will fit into any space 33 inches long, 22 inches wide, and 31 inches high. For further information write to the R. H. Sheppard Co., 47 Middle St., Hanover, Pa., or use the Request Card at page 18. Circle No. 253.

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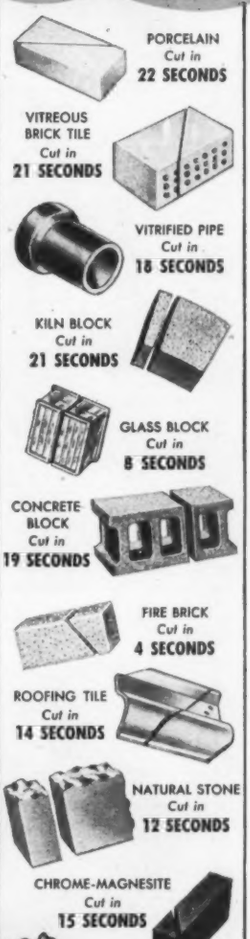
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Pipe Cast at Site For Outfall Lines

Job plant turned out 16 miles of reinforced-concrete pipe, 30 to 120-inch diameter, for sanitary sewer project

By WILLIAM H. QUIRK, Editor

1. Concrete is discharged from a Rex one-yard mixer into a Wagner Scoopmobile at the Blaw-Knox batch plant. *C. & E. Photos*

2. The Scoopmobile carries the concrete to the casting yard and places it in a Quinn steel form. American Vitrified Products Co. is casting all pipe at the job site.

ONE OF THE LARGEST sewer projects in the country will be completed this year for the metropolitan area of Birmingham, Ala. Jefferson County is the sponsoring agency for the program which includes six outfall lines and two treatment plants. The improvement covers an area of 140 square miles and includes not only the city of Birmingham—geographic center of the South—but 16 other adjoining municipalities. The new facilities replace and supplement a system 20 to 50 years old, which has long been inadequate to handle the requirements of this fast-growing industrial, commercial, and residential center of Alabama.

The Jefferson County Commission engaged the Chicago consulting engineering firm of Alvord, Burdick & Howson to study the county's sanitary problem and to prepare specific recommendations, plans, and specifications for the Village Creek sewer. Two local municipal and consulting engineer companies prepared the de-

3. A finished pipe section is hauled out to the job on a Fruehauf trailer, pulled by an International truck.

4. Trenches for the pipeline are blasted out of the rock. Here, a Le Roi-Cleveland tractor-mounted twin drill rig is at work drilling holes up to 24 feet deep. Air is supplied by the Ingersoll-Rand Gyro-Flo compressor.

5. After the trench is opened up by backhoes and cranes, sections of pipe for the outfall sewer are lowered into place. At this location the trench is 22 feet deep. Pipe is laid on a 6-inch cushion of slag.

tailed plans and specifications for four outfall sewers and two treatment plants and also supervised the construction of the facilities. They are Polglaze & Basenburg and J. W. Goodwin Engineering Co., Inc., both of Birmingham. Polglaze & Basenburg also supervised construction of the Village Creek sewer.

Total cost of the project approximates $14,000,000. Work got under way in July, 1951, and to date, five of the outfall sewers and the Valley Creek treatment plant have been completed. The Village Creek sewer will be completed by the end of the year. This portion of the program includes the areas that were rated as emergency. Sections in less dire need are next on the improvement program. Laterals connecting with these major outfalls are being installed by the various municipalities themselves.

Sanitation Project

The Birmingham metropolitan area is divided into four main topographical sections, each with its own trunk line sewer and disposal plant. This original system comprised about 55 miles of pipe, 8 to 66 inches in diameter.

Included in the improvement program are two sewage treatment plants known as the Village Creek and Valley Creek plants. The Valley Creek disposal plant has been completed by the Rust Engineering Co. of Pittsburgh, Pa., under a $94,086.42 contract. The Village Creek plant, which will cost close to $2,750,000, is not yet constructed, but excavation for the plant has been completed at a cost of $617,692.14.

Largest of the new outfalls is Village Creek sewer, 15½ miles long, where the former 36-inch line was replaced and extended with pipe up to 10 feet in diameter. All the pipe for this sewer was supplied by the American Vitrified Products Co., Cleveland, Ohio, which set up a complete pipe plant on the job. The pipe was furnished at a cost of $1,921,609.

In order to expedite the work, laying of the pipe for the Village Creek line was divided among four contractors. Section A-1, 14,223 feet of 96 and 120-inch pipe, went to Christie, Huchinson & Burton, Inc., of Birmingham for $873,590. Section A-2, 22,164 feet of 60, 66, and 72-inch pipe was laid by Blythe Bros. Co. of Charlotte, N. C., for $1,385,571. Section A-3, 39,227 feet of 12 to 60-inch pipe, was installed by J. E. Milan Construction Co. of Birmingham for $1,234,571. Installation of Section A-5, composed of 2,122 feet of 120-inch sewer, was awarded to Holt Rast & Associates for $241,948.85, and the work will be completed in December. The materials on this job are furnished by American Vitrified Products Co. at a cost of $169,228.20.

The sewer program is financed by a one-half mill ad valorem tax, enacted in 1901, and the sewer service charge, started in 1951. This charge is set at one-half the water bill with a maximum charge of $3.00 for all residential users. A total of 83,000 accounts pay the charge, which yields a total annual revenue of $998,500. The initial construction cost was financed by a $10,000,000 bond issue. Future construction will be financed from the sewer service charge revenue which exceeds amortization costs.

A separate project, boring a tunnel under a mountain to carry a 7,600-foot diversion sewer, was completed by the Michigan Sewer Construction Co. of Detroit under a $1,237,667.10 contract. The tunnel was drilled from 35 and 85-foot-deep shafts at each end. The sewer constructed in the tunnel section is 66 inches in diameter.

Other sewers in the project include the Homewood-Griffin Creek sewer installed by C. E. Adams & Co., Inc., of Birmingham at a cost of $237,251.35. L. H. Goddard of Birmingham laid the Crestline Park Mountain Brook relief sewer and the Mountain Brook relief sewer under $159,771.04 and $64,381.18 contracts respectively. Vitrified clay and cast iron pipe for these lines was furnished at a cost of $85,605.47.

Pipe for the Bessemer outfall was furnished and installed by J. E. Milan Construction Co. for $186,379.61.

Pipe Plant

The American Vitrified Products Co. set up a pipe-casting plant on a 25-acre site in the outskirts of Birmingham on a siding of the St. Louis-San Francisco R. R. The pipe, built of reinforced concrete, has a vitrified clay plate lining on the upper two-thirds of the circumference to protect the concrete from sewer gases. All the pipe, reinforced with wire mesh, was cast in 6-foot lengths and in diameters of 30, 33, 36, 42, 48, 54, 60, 66, 72, 90, 96, and 120 inches. Pipe thickness ranged from 3½ inches for the 30-inch pipe to 10 inches for the 120-inch-diameter size. Sections varied in weight from about one to 14 tons.

Materials for the pipe casting included Truscon, American Steel & Wire, and Keystone reinforcing mesh. Alpha, Lehigh and Lone Star cement came from Birmingham

(Continued on next page)

6. The heavy sections of pipe are carefully fitted together in the trench. De Witt mastic compound is used to seal the tongue and groove joints.

Pipe Cast at Site For Outfall Lines

(Continued from preceding page)

mills. Crosby Sand and Gravel Co., of Selma, Ala., furnished the sand. Slag for the coarse aggregate was supplied by the Birmingham Slag Co. and was trucked to the job site. Other materials were delivered by rail. City water was used in the mix.

A Blaw-Knox batch plant, consisting of a 400-ton aggregate bin and a 400-barrel cement bin, was erected close to the rail siding. Bucket elevators raised the materials to the hoppers, and from there they were weighed out into a Rex 1-yard concrete mixer at a lower level in the tower. Concrete was discharged directly into three mobile units—a 1-yard Erickson power lift truck and two ¾-yard Wagner Scoopmobiles—that hauled it to the forms. Quinn steel forms, built in two outside sections, were used throughout. With this setup, an average of 140 cubic yards of concrete was produced in an 8-hour day.

Clay Lining

Clay plate liners, ¾ inch thick, were shipped from the Crawfordville, Ind., plant of the American Vitrified Products Co. The liners, tied to the one-piece inside form, ran the full length of the form over two-thirds of the circumference. Then the reinforcing mesh, handled by a Lorain ½-yard crane, was set in place. Next the two-piece outside form was locked securely in place. Keys along the back of the clay plates bonded the lining material to the concrete.

The hauling units emptied their raised buckets of concrete directly into the forms. Depending on the size of the pipe being cast, two or four Vibro-Plus external vibrators were used on each section to vibrate the form as the concrete was being placed. Forms were usually left on for 12 hours after completion of a pour. Curing was done with water spray.

Specifications called for the concrete to have a strength of 4,500 psi at 28 days. Actually an average of 5,500-psi strength was maintained, with a maximum of 6,000-psi concrete being reached. Weights for a typical 1-yard batch were:

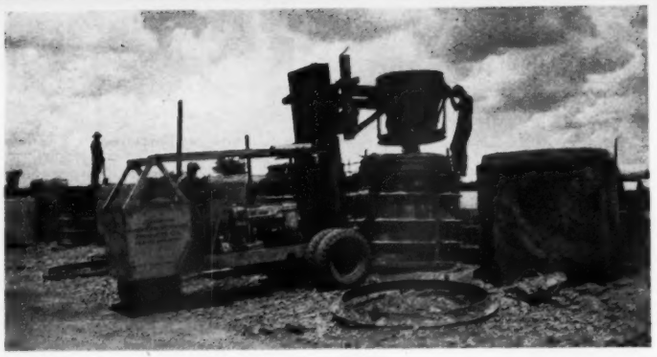
Cement	670 lbs.
Sand	1,350 lbs.
Slag, ¼ inch to No. 4	1,550 lbs.
Water (added) 26 gals.	217 lbs.
Total	3,787 lbs.

The pipe manufacturer also delivered his product to the contractor at the sewer site. A Ross carrier with a 10-ton capacity picked up the majority of the pipe sections and loaded them onto 36-foot trailers, two Rogers and a Fruehauf, that were pulled by L190 International tractors. Loading of the larger pipe sections was done with the help of a winch. The contractor handled the unloading operation with crane or backhoe.

American Vitrified Products Co. employed an average force of 68 at its pipe-casting plant with John H. Jordon, superintendent.

Typical Sewer-Laying Contract

Of the various sewer contractors, Blythe Bros. had the largest share of contract money for a job which included the installation of 7,144 feet of 72-inch, 7,600 feet of 66-inch, and 7,420 feet of 60-inch pipe. Maximum depth of cut was 22 feet, and the seamy dolomite rock throughout the job ranged from 6 to 13 feet in thickness. Instead of removing the overburden first, Blythe preferred drilling through the overburden down into the rock, then blasting and excavating all the material in one operation.



An Erickson power lift truck, handling a one-yard bucket, is also used to place concrete in the Quinn steel forms. *C. & E. Photo*

To drill in this manner, the contractor used a pair of Le Roi-Cleveland T286 pipeline drill rigs, one for each of the two crews he employed for digging trench and laying pipe. These units mount twin wagon drills on a tractor, and on this job they drilled holes up to 24 feet in depth using Timken bits ranging in size from 2¼ to 1⅝ inches. Air was supplied by an Ingersoll-Rand R600 Gyro-Flo rotary compressor powered by a GM diesel engine and towed by the drilling rig.

For a typical ditch with 9-foot bottom width, four holes were drilled on 3-foot centers across the line of the sewer trench. The same lengthwise spacing was also observed. Drill holes were charged with Hercules Gelamite No. 2 powder, with as

Specially developed for low-cost production of transit-mix concrete, this plant is a typical example of Johnson "complete-package" engineering. Plant is fully Johnson-equipped. Every function, from receiving and storage of materials to final weigh-out, is carefully coordinated for fast, accurate operation. Here's how it works:

Truck-receiving hopper (A) feeds cement into a screw conveyor, which carries the cement to enclosed bucket elevator (B). 275-bbl.-per-hour elevator fills an all-welded, 520-bbl. storage silo (C), or directs the flow of cement as needed into central compartment of plant bin (D). Aggregates are received at truck-unloading hopper (E). An open, inclined elevator (F) feeds the aggregates into a pivoted distributor, mounted at top of bin. Johnson welded tandem bin provides total overhead storage capacity of 110 cu. yds. for immediate plant use. Bin consists of four 19-yd. aggregate compartments, and a centrally-located, 250-bbl. cement compartment. On batcher floor, below bin, 2 cu. yd. Concentric Aggregate-Cement Batcher, and a Johnson water batcher accurately weigh out materials, and discharge into transit-mix trucks.

For any transit-mix, central-mix or concrete products operation, large or small, it will pay you to check the efficiency of Johnson plants and accessory equipment. See your Johnson distributor soon, or write us.

C.S. JOHNSON COMPANY

CHAMPAIGN, ILLINOIS • (Koehring Subsidiary)

CJ334

BINS • BATCHERS • RECEIVING HOPPERS • SILOS • ELEVATORS • ELEVATING CHARG

many as 30 sticks to a hole in some places, and with delays ranging up to 13 in number. About 13 cross rows were shot at one time. Two backhoes, 1½ and 2½-yard units, handled the excavation.

On Slag Cushion

Pipe was laid in the trench on a 6-inch slag cushion (⅜ inch down) with either the backhoes or a Bucyrus-Erie 22-B crane. Water presented no unusual problems. The trenches were kept dry with 3 or 4-inch pumps. No shoring was required. In the open areas, where most of the pipe was laid, slag screenings were used as backfill up to the springline of the pipe. Where the line was laid under city streets, the pipe was embedded in slag up to the surface of the ground. De Witt mastic compound was used to seal the tongue and groove joints.

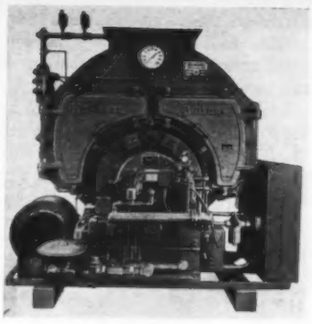
Two tractor-dozers—a Caterpillar D8 and an International TD18—handled the backfill. Surplus material was hauled away and used for fill in low areas.

An average force of 50 was employed on Blythe Bros. contract, under the supervision of W. D. Fairfax, construction engineer.

Personnel

The three-man county commission of Jefferson County, which directed the $14,000,000 construction program, is made up of W. D. Kendrick, president, Charles E. Harrison, and E. H. Gilmore. C. J. Rogers is county engineer, and R. C. Barton is sanitary engineer. F. W. Place was inspector for the county on the project. THE END

Need information on equipment? Use Request Card at page 18.



Boiler-Burner Unit

■ A new boiler-burner unit for high and low-pressure steam and for hot-water heating is announced jointly by the Kewanee-Ross Corp., Kewanee, Ill., and the Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif. The new boiler-burner unit is available in 39 to 456-hp models for high-pressure steam at 125 and 150 pounds water-pressure. Low-pressure units are offered in sizes to produce 1,313,000 to 15,300,000 Btu hourly at 15 pounds steam or 30 pounds water pressure.

Forced-draft operation with a new multistage secondary air control on the burner provides a constant-velocity-type air stream to the combustion zone. High turbulence, high turn-down ratio, and a high CO_2 content results in combustion efficiency.

The boiler, complete with controls, piping, and accessories, is assembled and shipped from the Kewanee plant. The burner, with its built-in forced-draft fan and windbox controls and accessories, arrives by separate shipment from the Ray factory.

For further information write to either of the companies, or use the Request Card at page 18. Circle No. 173.

Improved Welding Head

■ An improved automatic welding head is available from the Mir-O-Col Alloy Co., 312 N. Avenue 21, Los Angeles 31, Calif. Control of both welding head and positioner is automatic in the Model 944. The electro-mechanical control circuit stops both head and positioner if the arc is broken or if the electrode sticks to the work piece. A control cuts off the high-frequency pilot circuit when the arc is established. The motor drive is electrically independent of the positioner and welder power supply.

The feed-rolls on the welding head are adjustable for both solid and tube wire, and they accommodate rod sizes from ⅛ to ¼-inch diameter. The hold-down roll has an integral tension arm that eliminates springs.

The simplified control unit provides a manuel inching control and a welding voltage control which regulates deposit rate. Voltage and current meters are provided. The unit operates with any positioner or transformer, and maximum current capacity is 2,000 amps.

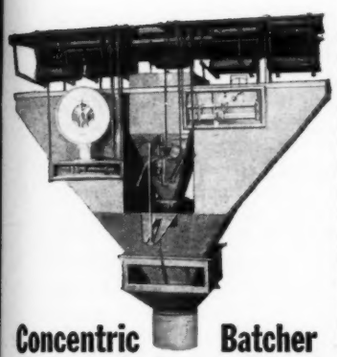
For further information write to the company, or use the Request Card at page 18. Circle No. 297.

Coating for Reservoirs

■ How an asphaltic coating is used to stop leakage in large reservoirs is told in a bulletin from the American Bitumuls & Asphalt Co., 200 Bush St., San Francisco 4, Calif. Laykold Weathercoat is a mixture of an asphaltic emulsion combined with mineral fillers. It is applied cold by trowel or spray and sets to an odorless, nontoxic, moistureproof coating.

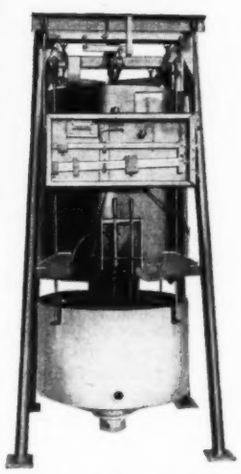
The coating is recommended for reservoir membrane linings because it performs through a wide temperature range and resists the effects of time and weather. The manufacturer reports that the cost of making a reservoir watertight with the coating has been about 16 per cent of the total cost of the reservoir.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 234.



Concentric Batcher gives central cement feed

In this exclusive Johnson Concentric Batcher, aggregates are arranged concentrically around cement . . . prevents "gumming". Cement is weighed on separate scale; aggregates are weighed on accumulative dial scale, or on individual beam scales. Sizes: 2 to 6 cu. yds., can be arranged for 2 to 8 aggregates, plus 1 to 4 types of cement. Fully automatic, air-ram operated . . . or semi-automatic . . . or manual controls.



Johnson Water Batcher

increases mix plant efficiency . . . gives close quality control of concrete. Accuracy is not affected by changes in water temperature. Capacities: 120-gal. (1,000 lbs.) for batches up to 3 yds., and 240-gal. (2,000 lbs.) for batches up to 6 yds. Either semi- or fully-automatic types available.

HAMSHELL, CONCRETE BUCKETS

NEW features on Kwik-Mix 16-S DANDIE®

Latest 16-S Dandie concrete mixer, interchangeable side or end discharge, has adjustable double-contact skip shaker, automatic water system, 3-point suspension mounting on heavy coil springs, cast steel drum heads with machined roller paths. Also, exclusive remixing action, and 8-second discharge with tilted Flow-Line Chute. Other models: 3½-S, 6-S, 11-S . . . bituminous, plaster-mortar mixers, power wheelbarrows.

KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.

17-FT.-PER-MIN. Parsons 88 Trenchmobile®

Rubber-tired Trenchmobile drives job-to-job at 12.6 m.p.h. . . . digs 8 or 12 in. wide, 5 ft. deep, up to 17 ft. per min. Sloping ladder boom makes vertical set-ins, undercuts sidewalks, curbs, old mains. Other features: hinged crumber, "Tap-In" digging teeth, reversible conveyor, optional backfill blade. Also ask your Parsons distributor about the 2 wheel-type and 3 ladder-type Trenchliners® . . . all full crawler mounted.

PARSONS (Koehring Subsidiary)
Newton, Iowa

MORE WORK-TIME with Koehring Dumptor®

With more than a ton of strength for every ton of payload capacity, Koehring 6-yard Dumptor withstands severest loading shocks. Sides, end and double-strength bottom are heavily rib-reinforced. Stationary or free-swinging kick-out pan adds another ½" steel plate to heavy-duty bottom. Gravity dump eliminates body hoist maintenance. 1-second dumping speeds haul cycles. Also check Dumptor fast no-turn shuttle hauling.

KOEHRING COMPANY
Milwaukee 16, Wis.
Y65

Data on Tractor-Shovel

■ The Hough Model HR 4-wheel drive Payloader tractor-shovel is the subject of a new catalog. The booklet contains action shots of this 1-cubic-yard machine doing earth-handling jobs for cities, counties, states, contractors, and aggregate producers.

Also included are pictures and specifications of all seven sizes of the company's tractor shovels.

To obtain this literature write to the Frank G. Hough Co., 762 Seventh St., Libertyville, Ill., or use the Request Card at page 18. Circle No. 221.

PREFERRED by CONTRACTORS
Less initial cost — Lower upkeep
1½ HP to 5 HP
MARVEL
CONCRETE VIBRATORS
GV-1, GV-2 & GV-3 MODELS NOW EQUIPPED WITH AUTOMATIC CENTRIFUGAL CLUTCH AS STANDARD EQUIPMENT.
INTERCHANGEABLE FLEXIBLE SHAFTS.
Write for full information
MARVEL EQUIPMENT CORPORATION
215-217 EAGLE ST. • B'KLYN 22, N. Y.

Line of Winter Clothing

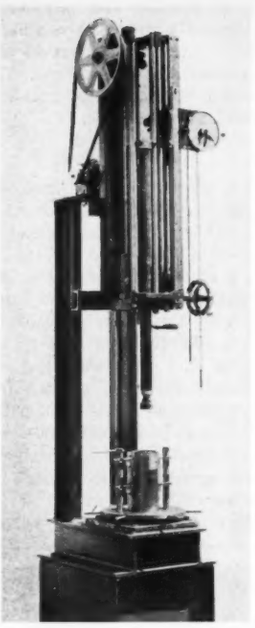
■ Insulated clothing that will allow men to work in the coldest weather is shown in literature from the Insulated Clothing Mfg. Co., Inc., 33 E. 38th St., New York 16, N. Y. Weather-Alls are said to keep the wearer comfortable in temperatures from minus 40 degrees to plus 60 degrees. All items in the air-cell-insulated clothing line are washable.

The line includes coats, suits, vests, shorts, caps, hoods, gloves, and socks. The apparel is made of nylon.

The literature stresses that the clothing makes for working efficiency under adverse weather conditions and adds to health and morale, reducing personnel turnover.

To obtain this literature write to the company or use the Request Card at page 18. Circle No. 178.

ANNOUNCING NEW
DODGE "Job-Rated" TRUCKS
Brilliant new design opens new era in trucking!
Compare their new comfort! Test their new handling ease!
See their new low work-saving design!
2 GREAT ENGINE LINE-UPS! In addition to cost-cutting 6's, Dodge now offers the most powerful V-8 engines of all leading trucks! Available in 1½-, 2-, and 2½-ton models . . . standard in 2¾-, 3-, 3½-ton! Revolutionary hemispherical combustion chamber for high efficiency! Get free book on engine efficiency and its importance to you at your Dodge dealer's!
OVER 75 NEW FEATURES! Spectacular low-built lines! New increases in G.C.W.! New cab sealing against dust, drafts! Nonskid running boards!
PLUS famous Dodge features like . . . completely rustproofed sheet metal . . . moistureproof ignition! Truck-o-matic transmission with gyrol Fluid Drive, available!
New! Even greater values . . . yet still priced with the lowest!
New! Sharper Turning! New steering system for the shortest turning of all leading trucks! New shorter conventional tractors! New, one-piece windshield! More total vision area than any other popular make!
New! Smarter Styling! New colors! New flow-line design, featuring integral fenders, sparkling chrome! New two-tone interior styling! New wider doors! New easy-chair seats! New instrument panel.
New! Lower Lines! Pick-up and panel floors knee-high for loading ease! Lower running board for easier entry! Lower hood for greater visibility! New, low center of gravity for road-hugging stability!
SEE YOUR FRIENDLY DODGE DEALER!



Soil-Testing Machine

■ A new machine for compaction tests on soils and soil-cement mixtures is announced by the Microchemical Specialties Co., 1834 University Ave., Berkeley 3, Calif. A rammer delivers the desired number of blows—up to 100—to the test sample as preset on a counting mechanism. The length of the rammer stroke can be set to any height up to 30 inches. As this ramming operation is automatic, the operator can give full attention to his manual rotation of the sample.

The machine, powered by an electric motor, can be stopped at any time during the cycle to adjust the sample. At the completion of the cycle, the counter is manually returned to zero, and the machine is ready to repeat the preset number of blows on a new sample. Single blows may be struck with the counter disengaged.

For further information write to the company or use the Request Card at page 18. Circle No. 183.

Corps of Engineers Merges Two Districts

Consolidation of the North and Northeast Districts of the Corps of Engineers, U. S. Army, will become effective December 1, 1953, and is expected to result in an annual savings of $400,000. The merger, to be known as the Northeast District, will have headquarters at 80 Varick St., New York, N. Y.

The move is being made as a result of a study directed by the chief of engineers to determine possible economies through consolidation of offices and the reassignment of functions. Col. Morton Solomon, presently in command of the Northeast District, will be in charge of the new district. It will continue under the East Ocean Division, of which Brig. Gen. Robert G. Lovett is division engineer.

The present Northeast District has jurisdiction over the construction of U. S. Air Bases at several locations in Greenland. The North District is supervising the design and construction of a U. S. air base and various supporting facilities in Iceland.

The Comfort tractor heater equipped with new windshield.

New Windshield For Tractor Heater

■ The tractor heater made by the Comfort Equipment Co., 2609 Walnut, Kansas City 8, Mo., has been improved by a new larger windshield available as an accessory. The windshield provides about 1,512 square inches of vision and attaches to all Model C-000 Comfort heaters except those for Fords and Fergusons.

Other accessories available include a cab top with side curtains, a back panel, and windshield extensions for the regular windshield.

For further information write to the company, or use the Request Card at page 18. Circle No. 298.

New Snowplow Blade For Powered Cart

■ A snow-removal blade that attaches to the company's powered wheelbarrow is announced by the Prime-Mover Co., Sampson St., Muscatine, Iowa. The blade for the Model 15 Prime-Mover is made with a spring-type counterbalance for easier raising and lowering.

While the blade unit is in use, the Prime-Mover may be equipped with either the 10-cubic-foot hopper or with the flatbed which makes it convenient to carry ballast for added traction on sand and to carry salt or cinders for sprinkling on icy sidewalks and driveways.

Measuring 50 inches in width, the blade can be set at an angle to either side. It adds to the versatility of the powered wheelbarrow, for which a bucket, platform, and a sprayer attachment for weed control are also available.

For further information write to the company, or use the Request Card at page 18. Circle No. 262.

Improved Overhaul Ball

■ Literature on a new type of overhaul ball with a special open-wedge socket is available from the Atlas Rigging & Supply Co., 462 Forest St., Kearny, N. J. The Howe overhaul ball and the open-wedge socket assemble into a single unit that increases the safety of the hoisting-rope rigging.

A cross-section illustration points out the advantages of the new design over previous types. A table of sizes and specifications is included. The company also offers a bulletin describing its wire-rope slings and pennants.

To obtain this literature write to the company or use the Request Card at page 18. Circle No. 184.

Bituminous-Mix Process

■ The durability of asphalt-aggregate mixtures under traffic is increased with the use of a patented process described in literature from the Kotal Co., 360 Springfield Ave., Summit, N. J. The Kotal process provides a method of producing improved cutback asphalt paving mixes by batch mix methods. It is said to work with a wide range of aggregates and asphalts and with the aggregates dried or undried. In addition to durability, the process provides water resistance and makes for convenience in handling.

The booklet describes stripping and stability tests with a comparison of treated and untreated mixtures. A table lists stabilities of samples steeped in water for 16 hours at 140 degrees F.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 238.

Dart Moves Office, Plant

Dart Mfg. & Sales Co., manufacturer of vibratory equipment, has set up new offices and a new plant in larger quarters at 1002 S. Jason St., Denver, Colo. In addition, the research department of the company has been expanded to facilitate its work on improved methods and equipment to promote concrete strength. The move was made necessary by the development of additional lines of Dart Vibratory equipment.

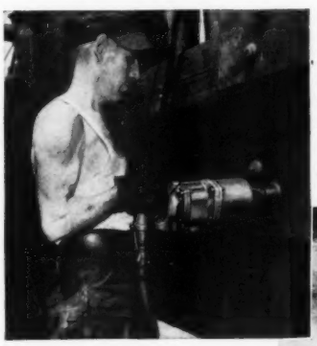
Use Swenson self-feeding material spreaders for fast, easy application of salt, chloride, sand, cinders, gravel or a combination of these materials

Free Information

Swenson Spreader & Mfg. Co.

Lindenwood, Illinois

make tough jobs EASY!



▲Tool of a Thousand Uses—CP-365 Air Impact Wrench is a real time saver in nut removal, bolting-up of structural steel members and driving lag screws. And it serves as a perfect maintenance tool—keeps equipment in top condition.

▲No job is too tough for CP Demolition Tools to handle. They afford maximum penetration, yet their easy handling qualities and responsive throttling action are ideal where footing is hazardous. Capacities range from the CP-111 (25 lb. class) to the CP-117 (80 lb. class).

◀ A team that's hard to beat! The heavy duty, diesel driven CP Portable Air Compressor supplying air for the G-300 Wagon Drill equipped with 70-NDC Drifter. An ideal team for fast, low cost drilling.

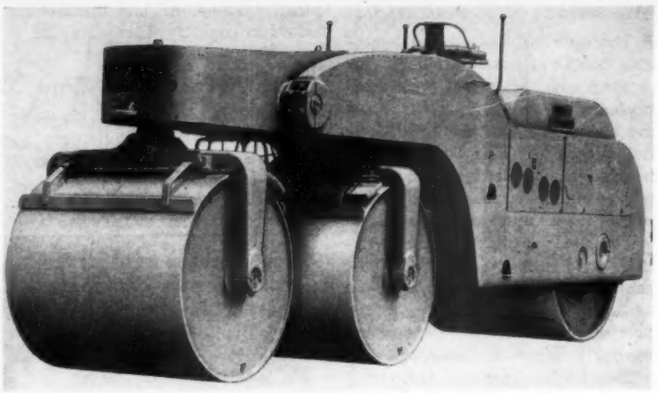
Chicago Pneumatic 8 East 44th Street, New York 17, N. Y.

PNEUMATIC TOOLS • AIR COMPRESSORS • ELECTRIC TOOLS • DIESEL ENGINES • ROCK DRILLS • HYDRAULIC TOOLS • VACUUM PUMPS • AVIATION ACCESSORIES

New Tandem Roller

■ A 13 to 20-ton three-axle tandem roller is announced by the Buffalo-Springfield Roller Co., 5212 Reservation Road, Springfield, Ohio. The unit, Model KX-25B, is so designed as to apply extra compactive effort to high spots, according to the manufacturer.

Both guide rolls are suspended from a single rotating beam. When the beam is semilocked, the end guide roll can pivot above, but not below, its normal position. As the end guide roll encounters a high spot in the material being rolled, the beam rotates and allows the roll to pass over the hump, exerting only normal pressure. This prepares the material for the high compaction of the center guide roll. As the center guide roll rises on the hump, the semilocked beam causes the entire guide end of the roller to rise with the center roll. This lifts the end guide roll off the surface and transfers its weight to the center guide roll, along with some of the weight of the drive roll.



The new Model KX-25B Buffalo-Springfield three-axle tandem roller is designed to concentrate its weight.

The beam can be used unlocked for rolling vertical curves and warped surfaces. It can also be used fully locked.

Other features include 4-speed transmission, a power package assembled as a single unit, and transverse engine mounting. Torque-converter drive is optional.

For further information write to the company, or use the Request Card at page 18. Circle No. 208.

Hydraulic Truck Hoist

■ A twin-cylinder hydraulic truck hoist is announced by the Heil Co., 3000 W. Montana St., Milwaukee 1, Wis. The lightweight Model 2426 hoist will fit 8 to 17-foot platform bodies and 8 to 10-foot dump bodies.

Operating features of the new hoist include a 50-degree dumping angle and a low mounting height. The distance from the top of the truck chassis to the bottom of the body is $9\frac{15}{16}$ inches.

The hoist can also be used with a ¾ or 1-ton pickup truck if the frame has no kickup and if the outside width is 36 inches or less.

Capacity of the new hoist when used with a platform body ranges from 3¼ tons for a 17-foot body to 6¼ tons for a 9-foot body. Mounted on a dump body, the hoist's payload capacity is rated from 5½ to 4¼ tons for 8 to 10-foot body lengths.

For further information write to the company, or use the Request Card at page 18. Circle No. 209.

Hot-Air Heating Units

■ A line of hot-air heaters is illustrated in literature from the Thermobloc Division of Prat-Daniel Corp., South Norwalk, Conn. Thermobloc heaters are made in a complete range of sizes with outputs of 100,000 to 1,000,000 Btu per hour. The heaters use gas or oil for fuel. In addition, a combination burner is available that switches instantaneously from one fuel to the other.

The heaters feature a powerful blower that pulls cool air in at the base and forces it up to and around the combustion chamber, discharging it at the proper velocity through the louvered outlets. While most installations do not require duct work, ducts can be run from any of the outlets to carry heated air to another area.

All Thermobloc models may be furnished as portable units mounted on steel trucks and equipped with built-in fuel tanks.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 248.

Why operate big, oversize compressors ?

The DAVEY Model 105 is the smallest, lightest 105 c.f.m. 2-stage compressor available today!

There's no sense to hauling around a cumbersome, heavy old style 105 ft. compressor. You can use a new, lightweight Davey and get more air per lb. of fuel along with greater service dependability and longer life.

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Davey's new **Multi-Port Valves** never carbon or foul . . . deliver more air per lb. of fuel . . . keep tools operating at maximum efficiency.

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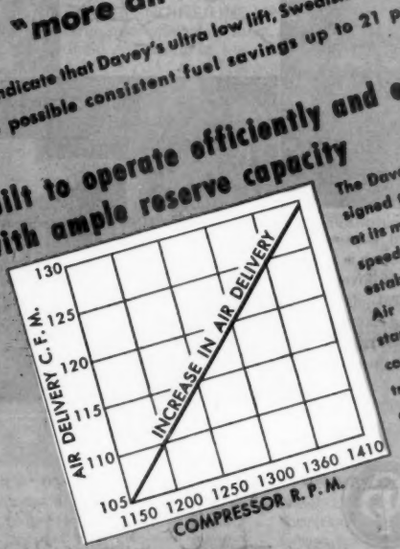
Davey Model 105s have been America's lightest weight, most compact 105 ft. portables since 1944.

Built to operate efficiently and economically with ample reserve capacity



The Davey Model 105 is designed to produce 105 c.f.m. at its most efficient operating speed in accordance with established Compressed Air and Gas Institute standards. However, the compressor possesses tremendous reserve capacity as shown by graph at left.

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Innovation aids construction of all-weather roads in India, where economy will not permit building of costly bridges:

Bitumen Drums Used In Vented Causeways

By S. CHATTERJEE, consulting engineer, Howrah, India

INDIA HAS COME UP with an innovation for economical all-weather roads in the way of vented causeways constructed from empty bitumen drums and concrete. The plan effectively combats the difficulties caused by torrential rivers during the rainy season without necessitating the building of major bridges.

The state of West Bengal, of which Calcutta is the capital, is a section criss-crossed with rivers ranging from the swift-flowing torrential ones to the slowly meandering tidal ones. India's economic situation cannot yet permit the construction of sturdy all-weather spans because of their high cost. The usual procedure is to build temporary bridges which are removed just before the heavy rains set in and are re-erected just after the flood season.

In cases where a river is at flood level only a few hours at a time, the vented causeway innovation is now being used. Often, the sand, water, and sometimes even the stone metals used to make up the concrete for these causeways can be obtained from the river itself.

Method of Construction

During the summer months, when the river is almost dry, the bed is excavated to a depth of 4 or 5 feet and to a width of at least 20 feet. Excavations are made in the locations where the temporary bridges had been erected. Using 10 per cent boulders, a concrete mix in a ratio of 1:4:8 is laid into the excavation to a depth of 4 feet.

Over this hard foundation, a layer of rich mortar, made of sand and cement, is laid. Then the empty bitumen drums, with indentations and both ends removed, are placed in rows along the course of the river. A 6 to 9-inch gap is left between each row of drums. These gaps are filled with a 1:2:4 concrete mix and the end shutterings are made similar to the nose shape of the piers.

Above the drums, a 1-foot layer of concrete is spread to load the drums and distribute the axle loads. The surface is finished with 3 inches of a 1:1½:3 mix wearing course. Expansion joints are used at intervals of about 20 feet. The finished product measures 250 x 16 feet, with 60-foot approaches on either side. Cost of the entire operation is 66,000 rupees, or about $13,860.

India's Road History

The ancient 1,200-mile-long Grand Trunk Road from Lahore to Calcutta was built by the Emperor Sher Shah more than four centuries ago. Although it was suitable for the primitive transportation, the increased speed and load capacity of modern vehicles demands improved road surfaces.

The Central government took a stepmotherly attitude toward the situation and, while railroads began to flourish, road improvement limped far behind. Local and provincial governments tried their best to maintain existing facilities, but the limited funds available to them made it a losing battle.

Finally, in 1929, a Central Road Fund was set up to alleviate the situation. Between 1929 and 1950, 1,250 miles of modern roads, 1,500 miles of fair-weather roads, 2,200 miles of road reconditioning, and 382 bridges, culverts, and causeways have been completed.

India's postwar plan of road development, the Nagpur Plan, was

(Concluded on next page)

Built in Light, Medium and Heavyweight sizes . . . the latter models drill to as much as 45' depths, using steel changes up to 15'—the Medium has "Hydra-Lift" hydraulic control.

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Bitumen Drums Used In Vented Causeways

(Continued from preceding page)

worked out in 1943. It envisaged a ten-year period of construction in which between 178,400 and 329,500 miles of roads would be built. One of its goals was that no agricultural village be more than five miles from a main road. The Nagpur Plan called for the expenditure of 7,440 million rupees.

National Highway

Presently, of the 13,000 miles of provisional national highways that was called for, along with 112 bridges, 12,000 miles has been completed. A new project, the first Five Year Plan, is aimed at laying almost all of the missing 1,000 miles of highway, in addition to constructing 60 bridges. The new plan also calls for the upgrading of 2,200 of the 7,500 miles of existing road surface which needs it.

The Central government has provided 270 million rupees to be used for national highways under this plan. It provided another 42.4 million rupees for the laying of certain strategic roads for which it has accepted full financial responsibility. Finally, it set aside 2.11 million rupees for the Central Road Research Institute.

State governments are concentrating on improving the condition of their fair-weather roads. By 1955-56, it is expected that there will be 20,582 miles of metal roads, compared with the 17,596 miles there were in 1950-51. The total provision for road development at the state level is 735.4 million rupees.

In certain states, village roads are being developed with the active cooperation of the villagers, who are contributing their land as well as their labor. Where local conditions are such that no hard metal can be obtained in the vicinity, the costs of metalling (consolidation by road rollers) is being absorbed by the states through local agencies.

Community-development projects throughout the country, aided by funds from the United States, are helping immensely to bring about improved environments. One of the major goals of these projects is the improving of surface transportation facilities, and progress along these lines has been satisfactory.

Road Costs

The cost of land constitutes a major factor in India's road-development program, accounting for 66 to 75 per cent of the total cost. National and state highways have been found to cost on the average of 150,000 rupees per mile, with district roads slightly less, at 125,000 rupees.

THE END

New Side-Dump Body

■ A new side-dump body is announced by the Galion Allsteel Body Co., Galion, Ohio. The special body, which has double lift arms, can be constructed to dump either to the right or left at a dump angle of 45 degrees. Four hinges form a pivot point which eliminates warp and twist to the truck frame when loads shift.

The side-dump body is constructed of 12-gage high-tensile steel and has box-type bracing. It is 90 inches wide inside and 96 inches wide over-all. Sides are 13 inches wide with a 19-inch tailgate. Bodies can be made from 8 to 10 feet in length with capacities from 3 to 6 cubic yards.

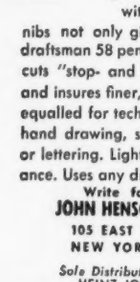
A typical use for the Galion side-dumper is in construction on narrow roads which require gravel, sand, cinder, slag, and other building materials to be dumped on the berm.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 197.

Bulletin on Conveyor

■ A new bulletin on its Builder conveyor is available from the Fairfield Engineering Co., Barnhart St., Marion, Ohio. It illustrates the conveyor handling bricks, blocks, tile, lumber, and corrugated metal sheets. The bulletin lists sizes and models available.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 277.



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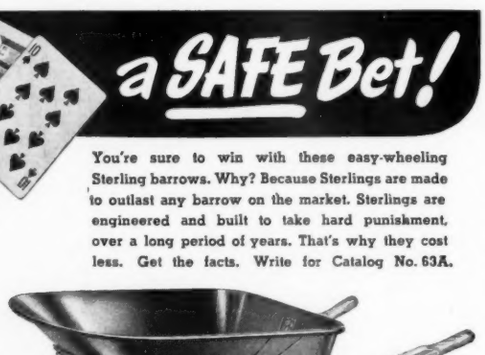

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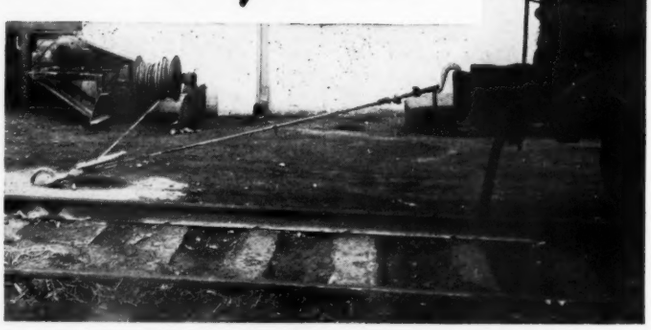
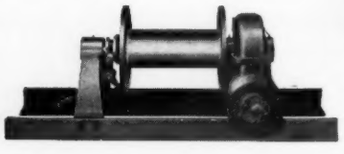




This Model 10 Tulsa Winch is used by a commercial chemical fertilizer manufacturer to spot freight cars for loading and unloading. It is powered by an electric motor and does not use lever controls.

Tulsa* Winch
TULSA, OKLAHOMA
DIVISION OF VICKERS Inc.

*Reg. U. S. Pat. Off.

Two New AISC Offices

The American Institute of Steel Construction, 101 Park Ave., New York 17, N. Y., has opened two new offices for district engineers in Pittsburgh, Pa., and Syracuse, N. Y., to bring the total of such offices throughout the U. S. to 17.

The Pittsburgh office, at 981-B, Union Trust Bldg., will be in the charge of A. R. Wright, who will serve the fabricators, architects, and engineers of western Pennsylvania and West Virginia. Mr. Wright has had more than 22 years experience in the steel fabricating field.

E. W. Gradt will operate the Syracuse office at 411 Marine Midland Bldg., and will represent the AISC in all New York State with the exception of the New York City metropolitan area. A former chief structural engineer for a consulting engineering firm, he was with the Navy Bureau of Yards & Docks during World War II.

New Magnetic Sweeper

■ A magnetic sweeper that picks up nails, spikes, tacks, and other jagged iron pieces is announced by the Eriez Mfg. Co., 420 Commerce Bldg., Erie, Pa. The Super-Sweeper can be pushed by hand, pulled by a jeep, or suspended from an industrial lift truck to clean highways, airports, and parking lots. The unit is adjustable to heights of 1, 1½, and 2 inches. The various road clearances can be obtained by loosening two set screws.

The sweeper is made in three strengths and in four widths, ranging from 24 to 60 inches in size. The magnet castings are enclosed in an aluminum housing.

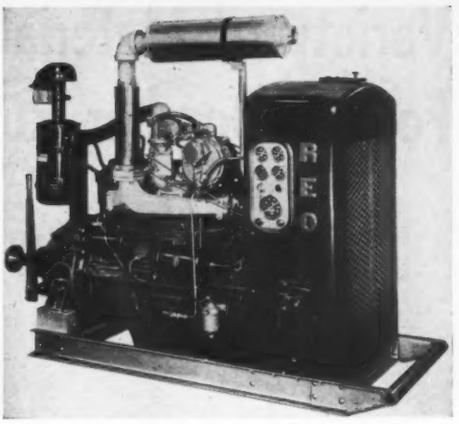
Another feature is the method of cleaning the magnet of accumulated tramp iron. A heavy canvas-reinforced cover uses two built-in steel rods which are held in place by the magnet's power of attraction. The magnetic element is turned to a face-up position, and the rubber cover is stripped off to remove the metal from the magnet face.

For further information write to the company, or use the Request Card at page 18. Circle No. 294.

Nordberg Opens Agency

The Nordberg Mfg. Co., manufacturers of diesel engines, compressors, hoists, and Symons crushers and screens, has opened a new district office at 3300 S. Second St., St. Louis, Mo. Harold M. Propp, formerly district manager in Milwaukee, has been named head of the new district organization.

Located in the Busch-Sulzer Division plant, the new office will serve crusher, screen, and process machinery customers in the south-central and southwestern states.



A new series of spark-ignition engines for use with gasoline, natural gas fuel, liquefied petroleum gas, or dual-fuel carburetion is announced by Reo Motors, Inc., Lansing 20, Mich. The line includes 6-cylinder 4-cycle engines of 292 or 331-cubic-inch displacement, or twin 6-cylinder 331-cubic-inch units. Maximum basic engine output for these units at 2,500 rpm is 105, 120, and 240 hp respectively. Shown above is a power-takeoff engine for liquefied petroleum gas. For further information write to the company, or use the Request Card at page 18. Circle No. 299.

ARNOLD LUBRICATOR AUTOMATICALLY OILS AIR TOOLS

Thus cuts maintenance costs, reduces downtime, prolongs tool life

Oil flow from Arnold Lubricator starts when air tool starts, stops when tool stops, automatically lubricates all working parts. Oil flow easily adjusted to tool needs. Can be filled under line pressure; window tells you when.

Light weight. Easily installed in hose line or on bench. Streamlined to prevent catching. No moving parts to get out of order. 4 sizes. Order from your equipment dealer TODAY, or write us for leaflet and prices.

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ALLIGATOR V-BELT DRIVES . . . you can make up all lengths of V-Belts quickly

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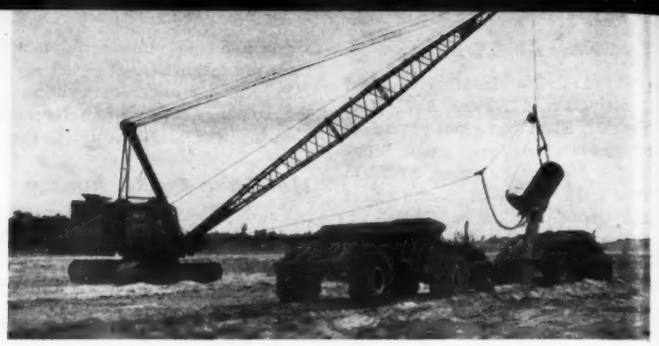
Variety of Materials For Jet Bomber Runway



Part of the grading was done by a Bucyrus-Erie 54B crane with a 4-yard dragline bucket which loads material into Euclid bottom-dump wagons. *C. & E. Photo*

IT TAKES a variety of bulk matrials to build a modern airplane runway from the bottom up — especially when part of the pavement is flexible and part is rigid.

The new 12,000-foot jet landing strip at Pine Castle Air Base near Orlando, Fla., required about ten different major types of material. To complicate matters, most of it was used at the same time, and all of it had to be delivered by rail. An extensive track layout was built by the contractor to handle the large operation.

In addition to the 12,000-foot runway, three taxiways, a parking apron, and two warm-up pads were also being built. The long list of materials required included finely divided lime rock for stabilization, 3½-inch lime rock for base course, two sizes of lime-rock coarse aggregate for cement concrete, two types of cement, coarse and fine aggregate for the bituminous concrete, and sand.

The $3,164,000 job was done by W. L. Cobb Construction Co., of Decatur, Ga. Work was directed by the Jacksonville District of the Corps of Engineers for the U. S. Air Force.

Jet Bomber Base

Pine Castle Air Base was reactivated in the summer of 1951 as a training field for medium jet bomber crews. Extensive construction was undertaken, including a 2,000-foot extension of the existing 10,000-foot runway. However, as the field grew, it became evident that another runway would be needed to increase traffic by permitting two bombers to take off at the same time. A new runway was authorized and laid out parallel to the old one. A large concrete parking apron to accommodate the increased number of aircraft was also included in the plans.

Runway Design

The new runway is 12,000 feet long and 200 feet wide. With the exception of 900 and 1,000-foot sections of rigid-type pavement at the ends, the runway pavement is of the flexible-type. Extending beyond each end is a 250-foot-long asphalt blast strip and a 750-foot-long overrun area. The 75-foot-wide flexible pavement taxiway connects with the runway at both ends and near the center. A warm-up area, 585 x 175 feet, borders a widened section of the taxiways at each end of the runway.

In cross section, the flexible part of the runway consists of 4 inches of plant-mix bituminous concrete on a 6-inch-thick lime-rock base course. Under this, the top 4 inches of the subgrade is stabilized with lime rock. The lower 16 inches is compacted to 100 per cent modified Proctor density.

The 1,000 and 900-foot-long concrete sections on the ends of the runway consist of 15-inch plain concrete pavement on a 6-inch-thick stabilized base. The pavement edges thicken from 15 to 18 inches in 12½ feet. The top 18 inches of the subgrade is compacted to 95 per cent density.

Both concrete and asphalt sections of the runway have a centerline crown with sides sloping at 1.5 per cent. The 200-foot shoulders slope at 2 per cent and will be covered with a 2-inch-thick muck blanket.

Grading

The 729,000 cubic yards of excavation was subcontracted to Hooper Construction Co., Inc., of Coral Gables, Fla. This contract also in-

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- for all-around performance

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A Lessmann digs 12" below wheel level, has 11" clearance, 8'6" dumping clearance. Three levers control all bucket movement. A single lever controls bucket or 'dozer blade's forward thrust of 7½ tons ... *while unit is standing still!* Blades, choice of shovel buckets, crane hook and lift forks adapt a Lessmann to hundreds of digging, 'dozing, loading and material handling applications. Bucket capacities from ⅝ yd. to 1¼ yds.
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Lime rock is spread by a Caterpillar No. 12 motor grader. It is then mixed with subgrade soil to provide a stabilized base course. *C. & E. Photo*

Following initial passes by a carwler-tractor, a Bros pneumatic-tire roller, pulled by an International ID9 tractor, gives the final compaction. *C. & E. Photo*

cluded the removal of 37,450 square yards of old concrete pavement. This was done by a Bucyrus-Erie 22B crane with a one-ton weight.

Grading the sandy subgrade was done with both scrapers and draglines. Hooper used a Bucyrus-Erie 54B and No. 6 Northwest with 15-yard Euclid wagons. Up to six Caterpillar D8's were required to level the dumps. The loose material was also well suited for the three Euclid scrapers pushed by D8's and Allis-Chalmers HD-20's. The 100 per cent compaction of the subgrade was achieved by loaded Euclid wagons, which rolled continuously as fill material was being placed to spread.

The grading subcontractor began work in those areas requiring future concrete pavement. This permitted the prime contractor to move in early on stabilization work, and thus permitted the concrete paving crew to start work immediately on the runway after it had completed the parking apron.

Stabilization

The subgrade in both concrete and bituminous sections of the runway, and also on the overrun areas, was stabilized with lime rock. This material is native to the coastal areas of the deep South and is used not only for stabilization, but also for embankments, base courses, and many types of aggregates. As a stabilization material, it is mixed with the subgrade soil, then rolled into an excellent surface. When properly proportioned and mixed with the native soil, the fine material is completely absorbed. The lime rock can be spread on, mixed with, and then rolled into the subgrade without any increase in the original elevation.

On the Pine Castle job, a 2-inch-thick mat of lime rock was mixed with 6 inches of shaped subgrade for concrete pavement without the grade being increased. The 4-inch base under the flexible pavement required 2½ inches of lime-rock stabilization. Accordingly, this subgrade was cut ½ inch low to permit a slight swelling when the lime rock was mixed with the soil.

Lime rock was unloaded from the cars and stockpiled along the track. A Northwest crane loaded trailer trucks, which supplied smaller stockpiles out near the runway. The proper proportion of lime rock to subgrade was achieved by using four 5-yard calibrated dump trucks. These units were loaded from the smaller piles with Hough Payloaders and dumped within certain limits. Then a Caterpillar No. 12 grader spread out the material and a Seaman Pulvi-Mixer followed to mix it with the subgrade. The contractor found he achieved best compaction

(Continued on next page)

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● Never before have so many important work-producing, money-saving features been incorporated in one motor grader—*and you get them all only in Adams improved heavy-duty models.*

A typical owner comment comes from C. H. Lawson, president of C. H. Lawson, Inc., contractors of Williamsburg, Va., who says of his new 100 hp. Adams, pictured above, "This is the best motor grader I have ever owned. I like its speed and traction, and it has plenty of power to handle a full blade. Also I like its ability to back up fast."

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J. D. ADAMS MANUFACTURING CO. • INDIANAPOLIS, IND.

Make your next motor grader an ADAMS

Variety of Materials For Jet Bomber Runway

(*Continued from preceding page*)

by first running a Cat D7 tractor over the mixed sections and following this with a Bros pneumatic-tired roller pulled by an International ID9 tractor. Two water trucks were used to develop the optimum moisture content.

Concrete Pavement

Concrete pavement was called for on the 1,000-foot end sections of the runway, on the warm-up pads, and on the 1,400 x 750-foot airplane parking apron. The job required 162,000 square yards of 15-inch concrete and 16,000 square yards of 15 to 18-inch concrete.

Batching equipment was set up along one side of a railroad spur, situated about ½ mile from the parking apron and the nearest end of the runway. The 3-batch trucks started their loading cycle at the 2-compartment coarse aggregate bin and proceeded through the Butler slag-cement bin, to the Butler portland-cement bin, the Blaw-Knox sand bin, and finally the Blaw-Knox fine-aggregate bin. The sand bin was stocked from cars or from stockpiles on either side by a Northwest Model 25 crane. A Bucyrus-Erie 38B crane stocked the 2-compartment bin with two grades of coarse aggregate.

Trucks are loaded with portland and slag cements from these Butler cement bins, part of the batching equipment set up about half a mile from the field. *C. & E. Photo*

Concrete Paving

The first concrete paving was done on the 750 x 1,400-foot parking apron. The subgrade was stabilized and graded under the same procedure followed for the runway.

The plans called for pouring the apron 25 feet wide in 1,400-foot-long strips.

To provide continuous work for the twin pavers, it was necessary to lay out three sections of the apron for pouring. After the lane adjacent to the existing taxiway was poured, the pavers moved over about 375 feet, poured an isolated 25-foot-wide strip along one of the high points, moved another 375 feet, and poured a third strip. With this setup, concrete for the remainder of the apron was always placed along a previously poured slab. This system reduced the total number of Heltzel 15-inch forms required, while permitting the full 72-hour cure.

The mix was hauled in ten 3-batch trucks to two Ransome 34E dual-drum pavers working side by side outside the forms. Production went as high as 925 batches, or about 1,270 cubic yards, in a 9-hour day. Water was pumped to the pavers from water trucks.

A Jaeger-Lakewood finisher followed behind to screed the concrete and vibrate it with the Jackson vibrators attached to the unit. After the surface was floated and finished, Hunt process curing compound was

Balanced Design...

ONE REASON WHY BUCYRUS ERIE BLADES CUT ROADBUILDING COSTS

WHAT BALANCED DESIGN IS . . . Bucyrus-Erie bulldozers and Bullgraders are mounted on International TD-14A and TD-18A tractors so that the vital balance point of the tractor remains virtually unchanged.

WHAT IT DOES . . . It means that the tractor retains all of its original tractive effort and maneuverability. It puts maximum driving force where it belongs — at the blade. Because there is always a full length of track on the ground, you take full advantage of tractor power and get fine, accurate control over the blade. Finally, there is less wear and tear on the tractor.

HOW IT CUTS ROADBUILDING COSTS . . . Better blade control and tractor maneuverability enables operator to produce accurate grading and fine finishing in a minimum of passes — *you save time.* Having the advantage of full tractor power lets you move more dirt on every pass and get the job done faster — *you save money.* Since there is no waste of tractor power, *you save fuel costs.* And lastly, because there's no upset of balance to strain the tractor there's less wear on tractor parts — *you save maintenance costs.*

Investigate these and the many other features offered in Bucyrus-Erie blade attachments. Get the complete story from your International Industrial Tractor Distributor today. 7153

BUCYRUS-ERIE COMPANY, South Milwaukee, Wisconsin

TD-14A and TD-18A Bullgraders and Bulldozers Hydraulic or Cable Controlled

SEE YOUR INTERNATIONAL INDUSTRIAL TRACTOR DISTRIBUTOR

NEWCO* WIRE ROPE CLAMP & THIMBLE

*trade mark

. . . gives holding efficiency of 95 to 100%.
. . . will not collapse.
. . . no shearing of bolts.

BEARING SERVICE is many times heavier; for example, the ⅝" Newco has a ½" bearing surface! Carries a heavier load, and the original cost is easily absorbed by savings on labor and longer life. In 12 sizes.

⅜" to 1" size **STEEL CLAMPS** (Approx. 80,000 PSI's)
⅛" to 5/16" **MANGANESE BRONZE** (Approx. 110,000 PSI's)

See your distributor or write direct to

NEWMAN MFG. & SALES CO.

Dept. CE-11, Box 5939, Kansas City 11, Mo.

applied at the rate of one gallon per 200 square feet, using a Flex-Plane mechanical applicator.

Transverse expansion joints were made with a ¾-inch celotex premolded strip and filled in with jet resistant Para-Plastic. An Aeroil oil heater kept the material hot. Load transfer dowels, 1½ inches in diameter and 20 inches long, were set in fiber sleeves on 18-inch centers. Expansion joints were spaced every 400 feet: dummy joints, every 25 feet.

Weights for a typical 37-cubic-foot batch were:

Sand	1,650 lbs.
¼ to 1-inch stone	1,381 lbs.
1 to 2½-inch stone	1,381 lbs.
Portland Cement	586 lbs.
Slag Cement	166 lbs
Water	41.5 gals.

Flexible Pavement

In addition to the lime-rock stabilization, the flexible section of the runway required a 6-inch compacted lime-rock base course. This material was loaded from stockpiles along one of the rail sidings with a Northwest Model 4 crane. Seven trailers and four trucks made the 1½-mile haul. Dozers leveled the dumps, and two Cat No. 12 graders spread out the rock base course. Water wagons maintained the proper amount of moisture as Buffalo-Springfield rollers did the compacting.

The limerock was prime coated after final grading, then tack coated before the top courses were applied.

The 4-inch-thick bituminous concrete top was applied in two layers by two Barber-Greene finishers, working as a team. Asphalt for the mix used on the 12,000-foot runway was supplied by The Texas Co.

The unusually large material-supply setup required the contractor to lay over 6,000 feet of track sidings off a branch of the Atlantic Coast Line Railroad that passes through the air base. The general plan was to lay three sidings, each about 2,000 feet long. On one side of the nearest siding, the contractor placed the line of concrete-batching bins and the stockpile of stabilization material. The second siding, almost paralleling the first, was long enough to hold 25 cars of rock base course. Ordinarily, the material was transferred from cars to trucks, eliminating double handling.

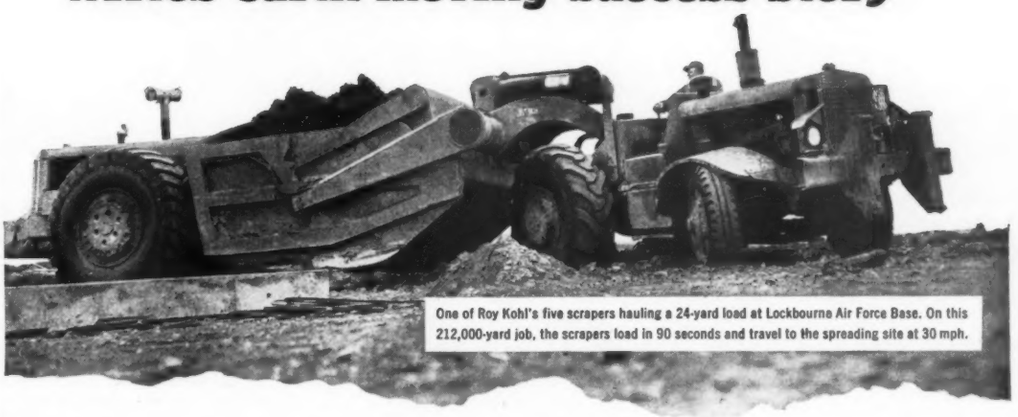
A Barber-Greene asphalt finishing machine, equipped with lights for night operations, lays the 4-inch asphaltic concrete pavement. Spread was made in two 2-inch passes.

A Cummer asphalt plant was located in the Y formed by the second and third sidings. Aggregates were stockpiled on both sides of the plant.

The 225-man job started early this year. J. W. Hayes was superintendent for W. L. Cobb Construction Co., and Major E. Johnson, resident engineer for the Corps of Engineers, U. S. Army. The work was under the direction of the Jacksonville District, headed by Colonel H. W. Schull, district engineer. THE END

Synchronized Power

writes earth-moving success story



One of Roy Kohl's five scrapers hauling a 24-yard load at Lockbourne Air Force Base. On this 212,000-yard job, the scrapers load in 90 seconds and travel to the spreading site at 30 mph.

In 1949, Roy Kohl was a basement excavating contractor in Ohio. During the last four years he has changed his operation and has moved more than 2½ million yards of ore, earth and clay on many types of big jobs.

His success story is built around the operation of 5 tandem-engine Euclid scrapers. The tandem-engine application—one pulling and one pushing—was made possible by Allison TORQMATIC DRIVES which synchronize the power of both engines through a simple control.

Kohl, like other operators, has found that Allison matched Torque Converters and hydraulic Transmissions contribute many ways to the more successful use of heavy-duty equipment. Most important, of course, is the ease of operation; the engines' ability to work at peak efficiency; and the cushioning effect which eliminates harmful shock on engines and the entire drive line.

Kohl reports his "Eucs" operate under all conditions, and climb up to 50% grades under full load. The five units now average over 2,000 hours a year. His first scraper moved more than a million yards without any major maintenance on Converter or Transmission.

Your dealer can give you more information about low-cost equipment maintenance where Allison TORQMATIC DRIVES are installed or you may wish to write Allison direct for full particulars.

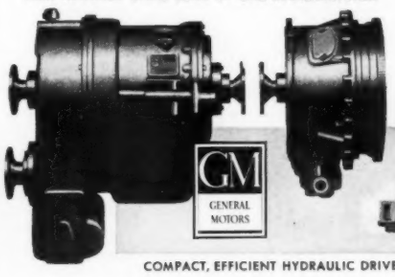
ALLISON DIVISION OF GENERAL MOTORS
Box 894CC, Indianapolis 6, Indiana

ALLISON TORQMATIC DRIVES

Unbeatable Team for Maximum Operating Economy

* *Quick-shifts* at full throttle with fingertip hydraulic control.
* *Holds* power to load at all times—no clutch pedal to push—no gearshift guess.
* *Cuts* maintenance cost by absorbing shock—eliminates engine lugging—prolongs equipment life.
* *Only* torque converter-transmission team designed to work as a unit and built by one manufacturer.

FIRST MATCHED UNITS BUILT BY ONE MANUFACTURER.



Allison TORQMATIC DRIVES

COMPACT, EFFICIENT HYDRAULIC DRIVES FOR CRANES • TRUCKS • TRACTORS • SCRAPERS • SHOVELS • DRILLING RIGS

Schoeller

ALUMINUM INSERTED DRAWING PAPERS FOR ORIGINAL PLANS

OFFER Extreme

- **Durability**
- **Resistance to Climatic Conditions**
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Schoeller Aluminum Inserted Drawing Papers are now used in making original plans

FOR: Aircraft Industries
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and many other purposes where permanent original plans are needed.

Schoeller Papers may be obtained in sheets or rolls, depending on thickness; also with 1 white and 1 cream side.

Write for sample and price lists to Dept. #3. Specially low priced sample orders available in rolls or sheets.

GEO-OPTIC CO. INC.
170 BROADWAY, NEW YORK 38, N. Y.

Improved Salamander Gives Smokeless Heat

■ An improved salamander is being marketed by the California Heater Co., 1511 W. Second St., Pomona, Calif. The heater has a flame spreader inside its large stack. The flame spreader, along with diagonal louvers in the stack, causes the flames inside the stack to burn in a spiral, which results in smokeless heat. With the hottest part of the heater's stack at the base, the result is greater sideward radiation.

The distilling-type heater has no wicks, jets, or valves and is lit with a match. One fueling lasts ten to 20 hours. The unit is made for temporary heating indoors and outdoors.

For further information write to the company or use the Request Card at page 18. Circle No. 179.

Booklet on Hard Facing In Spanish Translation

■ A Spanish edition of its booklet on hard-facing alloys is announced by the Stoody Co., 11936 E. Slauson Ave., Whittier, Calif. The booklet describes and illustrates more than 100 of the ordinary uses of hard-facing alloys in the maintenance of heavy equipment used in earth-moving and in cement plants, among other kinds of work.

Considerable space is given to the maintenance of all types of crawler equipment. Like its English counterpart, the Spanish edition is confined to manual applications of hard-facing alloys.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 270.

Kentucky Buys Bridge

An 86-year-old suspension bridge, which spans the Ohio River between Cincinnati, Ohio, and Covington, Ky., has been acquired by the state of Kentucky through the purchase of all outstanding stock of the Sarjem Corp., New York, N. Y., owners of the bridge.

At the time of its completion in 1867, the 2,206-foot-long structure was the longest suspension bridge in the world. It satisfied the demands of cross-river traffic until 1895, at which time an extensive rehabilitation program was started. Minor improvements were made in 1910, 1921, and 1934 without affecting the characteristics or capacity of the span.

The Louisville, Ky., engineering firm of Hazelet & Erdal, engaged by the Kentucky Department of Highways to determine the present condition of the structure, has recommended new rehabilitation work. Estimated cost of the job, including engineering charges, was given at $610,000.

Platform-Tilt Trailers For Hauling Equipment

■ Tilt-Top trailers for hauling equipment are illustrated in a booklet from Miller Research Engineers, 456 S. 92nd St., Milwaukee 14, Wis. The literature describes 6, 8, and 10-ton standard and low-platform models.

A hydraulic tilt-control absorbs the shock of loading and unloading, keeping it from the trailer and tow unit. The platform is said to lower smoothly under the heaviest loads.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 268.

Pneumatic Wrenches

■ Three new impact wrenches are announced by the Mall Tool Co., 7725 S. Chicago Ave., Chicago 19, Ill. The wrenches are suitable for removing bolts, nuts, and broken cap screws and studs. They can also do tapping and reaming and can drive or remove lag screws and screw spikes. All three models have five-vane rotary-type air motors with a built-in automatic oiler and pin lock.

The Model PW-5014S takes a ⅞-inch bolt or nut. Its spindle has a ¾-inch square drive, and its operating speed is 1,600 rpm free at 90 psi. The Model PW-4012P takes a ¾-inch bolt or nut and has a spindle with a ¾-inch square drive. It operates at 1,400 rpm at 90 psi. The Model PW-308P has a ½-inch bolt or nut capacity with a ½-inch square drive spindle. Free speed is 1,400 rpm at 90 psi.

For further information write to the company, or use the Request Card at page 18. Circle No. 193.

Meili-Blumberg Is Sold

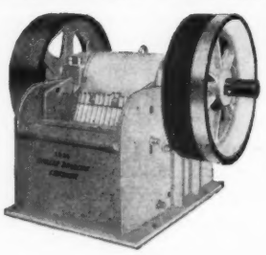
The Meili-Blumberg Corp., New Holstein, Wis., has been purchased by Robert B. Evans, of Detroit, Mich. Mr. Evans is president of the new organization, and Les Blumberg, son of the founder, is vice president and assistant general manager. Joseph M. Dorocke, formerly with Harnischfeger Corp., has joined the organization in a sales capacity.

The firm will continue to manufacture a full line of street and highway markers, tractor-mounted sweepers, pull-type sweepers, and graders for Case tractors and highway trailers.

A 3 IN 1 ADVANTAGE

WITH TWINDUAL ROLLS

3 SEPARATE CRUSHING OPERATIONS IN 1 PORTABLE ROCK PLANT

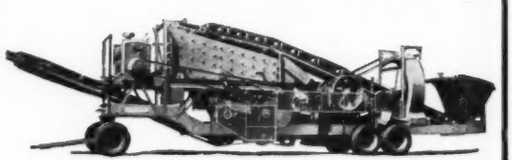


1ST. STAGE — Overhead Eccentric Jaw Crusher

Rock or gravel is fed by apron feeder to jaw crusher. Both feeder and jaws can be skid mounted for simple removal. Bar grizzly and by-pass relieves crusher of material not requiring primary reduction — reduces unnecessary wear and clogging. Pacemaker Jaw Crusher produces two distinct blows with each revolution of Universal's overhead eccentric shaft, famous in the industry for 47 years. Primary blow at the top of the jaw and secondary blow at the bottom. Force feed action and fast discharge results in high capacity, more production, top profits. Roller bearings are equipped with piston ring seals to keep lubricant in, dirt and grit out.

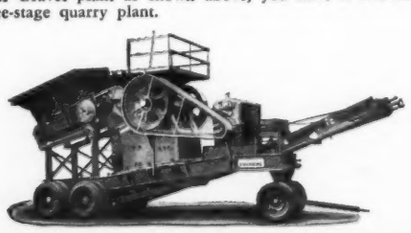
OTHER PROVEN UNIVERSAL PLANTS WITH THE EXCLUSIVE TWINDUAL ROLLS

293QS Gravel King A complete portable gravel crushing, screening and loading plant with three stages of crushing, two separate screening operations. 1824 or 2036 RB jaw crushers.

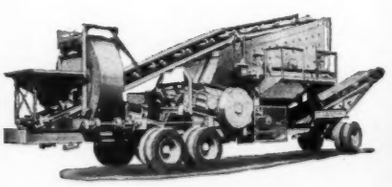


TDM24 Master Gravel Plant Especially profitable where a highly mobile, low weight plant is required for a top capacity, flexible operation. Three full stages of reduction. 1024 RB jaw crusher.

546P Portable Primary Crusher 1824, 2036, 2436 or 3042 RB Jaw Crushers. Combined with a TDS Secondary Twin Dual Gravel plant as shown above, you have a two-unit, three-stage quarry plant.



TDS30 - TDS40 Portable Secondary Plants Complete two-stage roll crushing, screening and loading plants. 30 or 40 inch TwinDual roll crushers.



Double-Jacketed Furnace Melts Rubber Joint-Sealer

■ A new wheel-mounted double-jacketed melting furnace is described in literature from the Hauck Mfg. Co., 124-136 Tenth St., Brooklyn 15, N. Y. The L-P gas-burning No. 48 heater is recommended for melting rubberized joint sealers such as rubber and plastic, and rubber and asphalt combinations.

The melting kettle holds 16 gallons of joint sealer and heats indirectly through an oil bath. Cylinder oil, used as the heat-transfer medium, absorbs the high-temperature burner heat and transfers a low, even temperature on the inner melting kettle so that there are no hot spots.

The removable melting kettle is made of heavy steel. The manufacturer stresses that it heats fast while retaining little heat, so that close temperature control on the material can be maintained. Sixteen gallons of compound can be brought up to heat in 30 minutes to one hour, depending on the type of compound being melted.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 241.

Cleco Appoints Kensel

Ray Kensel has been named district sales manager for the Cleco Air Tool Division of Reed Roller Bit Co., Houston, Texas, manufacturer of portable air tools. He will cover the Detroit, Cleveland, Cincinnati, and Indianapolis area. Mr. Kensel's office will be in Detroit, the district headquarters for Cleco's Michigan-Ohio-Indiana sales and service area.

Weld-Strength Calculator

■ A weld-strength calculator for use in steel-plate fabrication is available from the Lukens Steel Co., Coatesville, Pa. The device is a plastic slide rule that indicates both the size of weld required for a given applied load and the weight of a given length of weld in pounds. The calculator gives values for stresses ranging from 2,000 to 20,000 psi and applied loads of from 9,000 to 450,000 pounds.

Basic design data for welded connections is graphically shown on the reverse side of this pocket-size calculator. Formulas for calculating normal properties of welded connections are listed in convenient form.

To obtain this calculator write to the company, or use the Request Card at page 18. Circle No. 214.

Power-Steer Booster Has Improved Control

■ An automatic power-steering unit has a new control valve that permits the truck operator to select the appropriate degree of steering assist at the flick of a finger is announced by the Air-O-Matic Power Steer Corp., 24 Noble Court, N.W., Cleveland 13, Ohio. The valve is operated by a lever which the driver can move up or down to control the Air-O-Matic power-steer booster without taking his eyes off the road or his hands off the steering wheel. The valve is mounted on the truck steering column for either right or left-hand operation.

The Air-O-Matic power-steer booster, which works on compressed air, is installed between a stationary part of the vehicle and a movable part of the steering linkage. The immediate control of steering assistance offered by the new control valve eliminates the possibility of over-steering and, therefore, results in safer vehicle operation.

For further information write to the company, or use the Request Card at page 18. Circle No. 250.

Sheet Metal Construction Subject of Color Movie

A 46-minute color motion picture, "Sheet Metal in Building Construction", has been made under the auspices of the research and development department of Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y. The film documents the principles of sheet metal construction which Revere recommends.

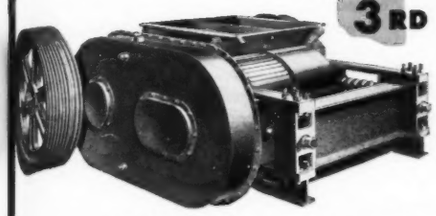
It has been described as a pictorial version of Revere's standard work in this field, "Copper and Common Sense". Scenes show outstanding examples of copper roofing, research technicians at work in Revere's field laboratory in Rome, N. Y., correctly designed copper forms resisting tensile and compression tests, and differences of design, methods, and craftsmanship of building jobs throughout the northeastern section of the country.

Animated charts and sectional drawings illustrate the formula for average critical loads. Among the structures photographed are the UN assembly building, Cornell and Columbia universities, Yankee Stadium, and the Hayden Planetarium. The majority of the roofing, valley, and gutter shots were made in Rome and West Point, N. Y.

Although most of the location shots depict copper being formed and actually installed on the job, the principles illustrated apply to other sheet metals as well. Prints of the 16 mm film are available through Revere's New York office.

UNIVERSAL'S 293Q PACEMAKER ROCK PLANT

2ND STAGE
3RD STAGE
} UNIVERSAL'S Exclusive TwinDual Rolls



The roughing deck of the screen selects only the large oversize from the first stage of crushing and routes it to the roughing rolls of the Twin Dual Roll Crushers. Roll feed utilizes full width of rolls. 30% to 50% of the material crushed in this second stage is finished and removed when returned to the screen. 15% recirculates and the balance is reduced by the third stage. The finishing deck of the screen removes specification material resulting from any of the three stages of crushing. The oversize from this finishing deck is chuted to the finishing rolls of the Twin Dual Roll Crusher.

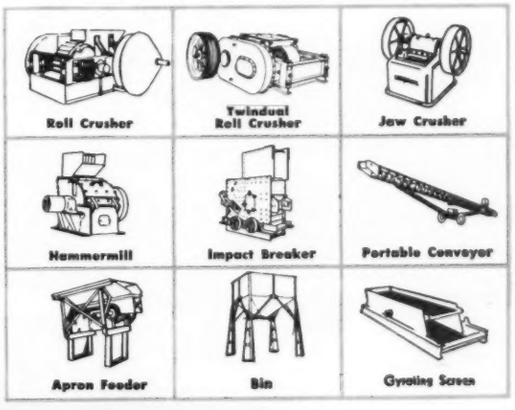
PLUS THESE UNIVERSAL ADVANTAGES

Portability . . . saves time in moving and setup, cuts operating costs on the job. Apron feeder and jaws can be skid mounted to obtain low rear axle weight.

Dependability . . . balanced construction, the even, steady flow of material at every stage of operation cuts "downtime" and maintenance costs.

Capacity . . . again, **Balanced Construction,** big jaws, rolls, screens and conveyors feeding and discharging at capacity—produce maximum tonnage.

Universal's 293Q Pacemaker Rock Plant is acclaimed by owners everywhere as a top producer in the field.



FOR TOP PROFITS BUILD WITH UNIVERSAL SOUNDLY ENGINEERED BASIC UNITS

Whatever your particular crushing, screening, washing, or loading problems might be, Universal equipment invites comparison. For information on the complete Universal line see your nearest Universal distributor or write UNIVERSAL ENGINEERING CORPORATION, 620 C AVENUE N.W., CEDAR RAPIDS, IOWA, a subsidiary of Pettibone Mulliken Corporation, 4700 W. Division Street, Chicago 51, Illinois.

When you move, move quickly and easily with Universal Portable Plants . . . and you move on to greater profits.

UNIVERSAL GAVE CEDAR RAPIDS ITS ORIGINAL FAME FOR QUALITY CRUSHERS

IN CEDAR RAPIDS SINCE 1906

PMCP UNIVERSAL

ENGINEERED FOR TOP OPERATING PROFITS

Fiber Pipe Insulation

■ A fibered preformed pipe insulation said to be more resistant to abuse and easier to handle is made by the Owens-Corning Fiberglas Corp., Nicholas Bldg., Toledo 1, Ohio. The improved insulation is intended for use at temperatures from sub-zero to 450 degrees F. It is available with canvas coverings or vapor-seal jackets for cold lines. A waterproof roofing-felt jacket is offered for outdoor use.

The new pipe insulation is said to be durable, fire-safe, noncorrosive, moisture-resistant, and resilient. It provides no sustenance for insects, mold growth, or vermin. The manufacturer reports that the thermal conductivity of the fine-fibered insulation has been improved about 5 per cent over an earlier type.

For further information write to the company, or use the Request Card at page 18. Circle No. 249.

Asphalt Plant Bulletin

■ A bulletin on asphalt plants is available from the F. D. Cummer & Son Co., 1827 E. 18th St., Cleveland 14, Ohio. The literature briefly describes the company's portable, semiportable, and stationary plants offered in capacities ranging from 55 to 125 tons per hour.

A schematic drawing illustrates the various working parts of the batch-type asphalt plants produced by Cummer.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 194.

Land-Clearing Begun For Texas Reservoir

Work proceeding ahead of schedule on 16,000-acre project with the help of new tree-sawing equipment

DESPITE HEAVY RAINS at the beginning of the summer, land clearing in the Texas Reservoir area, where construction of a dam and holding pool is underway as part of the Lower Mississippi flood control program, is proceeding ahead of schedule. (See CONTRACTORS AND ENGINEERS, August, 1953, pg. 84, "Texarkana Dam Nears Final Closure Stage").

The reservoir is located on the Sulphur River, 20 miles above the Red River and 15 miles southwest of Texarkana, Texas. The project is under the jurisdiction of the New Orleans District, Corps of Engineers, U. S. Army.

The land-clearing contract was awarded to Benson & Youngman, Muskogee, Okla., but has been subcontracted to R. G. LeTourneau, Inc., Longview, Texas. LeTourneau has been using this opportunity to demonstrate its new tree-saw, the Tournasaw, and other of its land-clearing equipment. Clearing operations on the 16,000-acre tract were started at the end of June and are expected to be completed within two years.

The tract is along the Sulphur River and has a top elevation of 225 feet. All trees, undergrowth, logs, loose stumps, and floatable material must be removed within the limits of the work. All areas above 215 feet in elevation must be cleared to within six inches of the ground. Below that elevation, cuts may be made at any height not to exceed the 215-foot line.

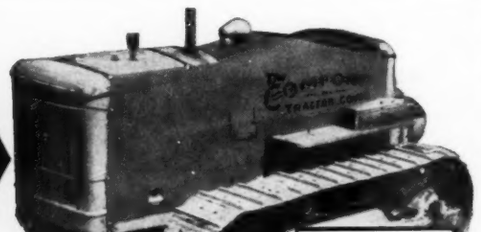
On September 11, the LeTourneau organization played host to contractors, engineers, government officials, and representatives of the press who had gathered at Texarkana to observe the first public demonstration of the Tournasaw. They also saw the new LeTourneau LC tractors and other land-clearing equipment.

The general character of the soil at the reservoir site is clay overlaid with black silt. Most of the trees are oak, with a few gum, hickory, and elm. The Tournasaw and the LC Tractor work together in the land-clearing operation. They move in ever-growing counterclockwise circles. The tractor clears away brush and saplings, preparing the way for the Tournasaw, which cuts and fells the large trees in a matter of seconds.

Developed in Liberia, Africa, the Tournasaw has an overhead boom which controls the direction of the tree's fall in a radial line even as the cut is being made.

The radial-line fall of the trees makes decking by the LeTourneau

The Improved HEATER for CRAWLERS



Made By The World's Largest Manufacturer Of Tractor Heaters

CUSTOM FIT NO HOLES TO CUT IN CANVAS

COMFORT® HEATER

U.S. Pat. Nos. 2,452,834; 2,461,974 Canadian Pat. No. 471,256

PROVIDES 7 ADVANCED IMPROVEMENTS NO OTHER CRAWLER HEATER CAN MATCH

- ✓ Designed to accommodate dozers and other generally used equipment.
- ✓ Special tailored flaps allow easy access to starting motor, oil sticks, etc. No holes to cut.
- ✓ Tractor operating controls in protected area.
- ✓ Motor side panels fold back for heat control on warmer days.
- ✓ No ties or springs under tractor to snag on brush or other obstructions.
- ✓ Sturdiest crawler tractor heater built — made of heavy iron framework and heavy weather resistant canvas.
- ✓ Custom tailoring gives better fit — more efficient operation.

WINDSHIELDS AVAILABLE

Optional at small extra cost. 2 windshields can be used on models designed for twin seat tractors.

Ask Your Distributor for Complete Details or Write

COMFORT EQUIPMENT COMPANY 2609 AG Walnut • Kansas City, Mo.

DID YOU SAY PORTABLE?

YES! Here's the scale that can be moved from job to job as a unit by merely removing six bolts which hold the side levers in place . . . It can also be installed as a pitless scale, saving expensive concrete pit - construction costs.

ACCURATE . . . perfectly balanced for "Lifetime-Accuracy." Wide steel bases, at both ends, support scale, therefore require no concrete footings. Easy-to read weighbeam is chrome-plated. Other vital parts are electro-plated against corrosion.

Capacities: 20, 25 & 30 Ton
Platform Lengths: 18, 22, 24 and 30 ft.

THE THURMAN PORTABLE TRUCK SCALE Est. 1918

THURMAN MACHINE CO. 156 North Fifth Street Columbus, Ohio Dept. C

Reduce costs and INCREASE PROFITS by renting these metal forms for concrete

Economy Metal Forms save time, labor and material. They quickly lock together with a simple twist of a clamp. Standard units fit most jobs. Where needed, special forms can be fabricated to specification.

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Home Office: Des Moines, Iowa
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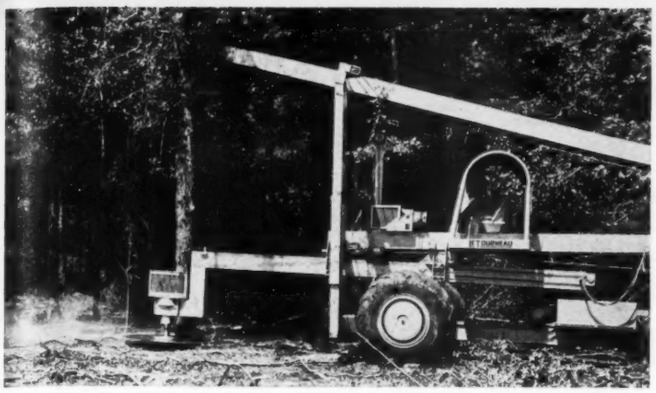
ECONOMY FORMS
metal forms for concrete construction



A mist of sawdust settles as a Tournasaw completes its swing through the base of a tree. The trunk will now be toppled by pressure from the overhead boom.

tractors a simplified task. The trees are left where they fall for two weeks so that there is sufficient time for the wood and leaves to dry thoroughly before decking operations begin. After decking, the trunks are burned. LeTourneau tractors, with extended horizontal bars, poke up the fires every twelve hours.

Little time is lost during the two 10-hour shifts. A Dodge Power Wagon, equipped with oil, water, and Schramm compressor, services the saws and tractors. In addition, each saw and tractor is supplied with an Igloo cooler for drinking water. Saw blades are sharpened on the job instead of in the maintenance area. As a result, the Tournasaw and the LC Tractor can clear 20 to 30 acres in each 10-hour shift.

At the Texarkana job, the two machines have operated only during the daylight hours. However, their electric power does permit the use of floodlight equipment at night.

Rainfall during July cut down clearing speed, but the job is still proceeding ahead of schedule. As of September 1, nine per cent of the area had been cleared. The working season should continue through the end of December, when weather conditions will probably make further operations unfeasible.

THE END

Heavy-Duty Motor Oil

■ A new highly detergent heavy-duty motor oil for modern high-power automotive engines is being marketed by The Texas Co., 135 E. 42nd St., New York, N. Y. Detergent properties that promote the efficient operation of such precision mechanisms as the hydraulic valve lifters now common in the newer engines are claimed for the new oil. Advanced Custom-Made Havoline.

The company points out that because of the ultra-close tolerances of modern engine components, the internal oil flow rate is very low. The parts are particularly sensitive to the formation of tiny amounts of varnish, sludge, or carbon deposits. The oil is designed to prevent sluggish operation and sticking of the hydraulic valve lifters resulting from improper lubrication.

For further information write to the company, or use the Request Card at page 18. Circle No. 279.

I-H Promotion

Gerald M. Just has been appointed credit and collection manager of the industrial power division of International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., manufacturer of industrial engines and tractors. He was formerly a credit manager at the firm's general office in Chicago.

Mr. Just will be assisted by R. W. Hooton, former assistant district credit manager at Harvester's Peoria, Ill., office.

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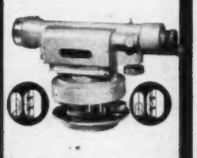

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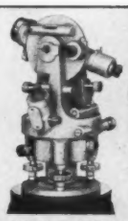

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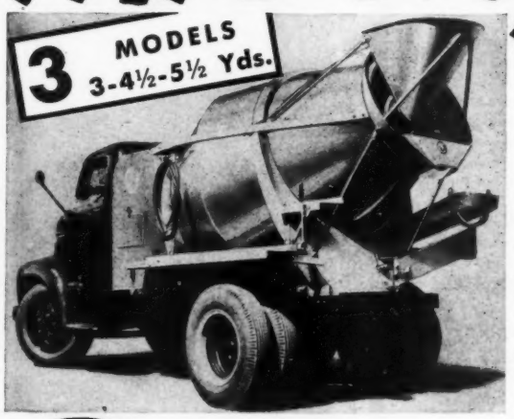

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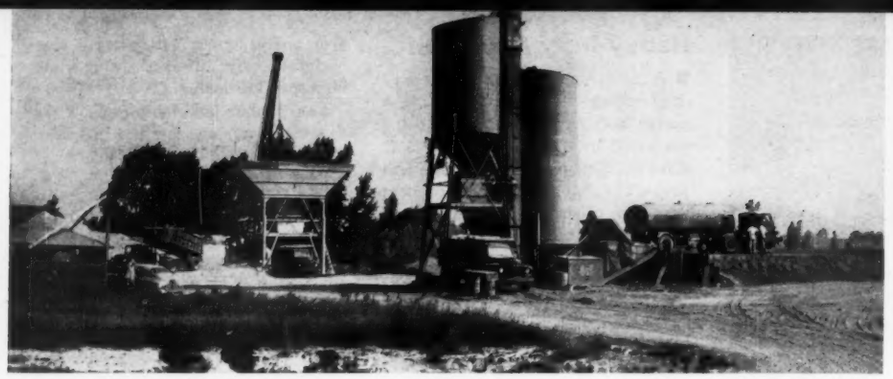
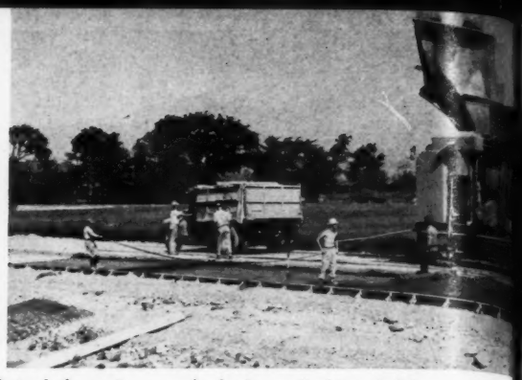


A Fruehauf bulk-cement hauler unloads its 90 barrels of cement for Johnson, Drake & Piper. Batch trucks are loaded under the Blaw-Knox aggregate bin and cement silo.



Part of the paving spread, showing a Koehring dual-drum paver

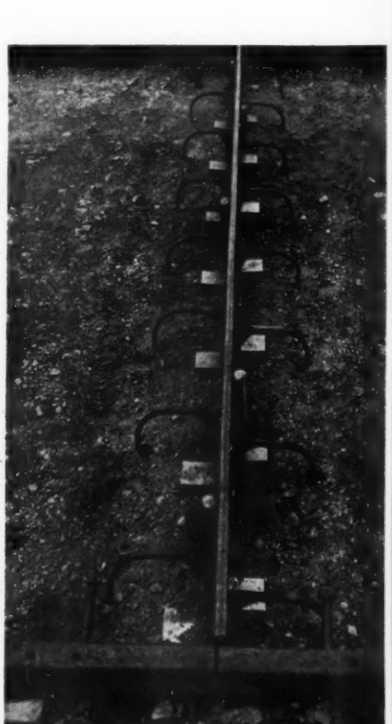
C. & E. Photos

Contractors Speed Thruway Construction

Concrete paving at western end of New York superhighway is expedited to permit opening before the end of the year

IF CONCRETE PAVING work continues at its present fast pace, tolls may begin coming in from western sections of the New York Thruway by the end of this year. Completion date for the entire 427-mile route between New York and Buffalo is some time late in 1954.

Early this summer, CONTRACTORS AND ENGINEERS made stops at the two biggest paving jobs between Rochester and Buffalo to see how the contractors were keeping within their tight schedules. Arute Bros., Inc., of New Britain, Conn., was paving a 10-mile stretch west of the Genesee-Monroe County line, and



Acme expansion joints, above, are used extensively on the western section of the N. Y. Thruway.

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Blaw-Knox spreader.

A Buckeye Finegrader removes excess material from between the forms on the Arute contract.

Johnson, Drake & Piper Overseas Corp., New York, had 8.2 miles under way near the Erie County line. Arute was working two separate paving spreads ten hours a day, and Johnson, Drake, & Piper kept one spread operating practically around the clock.

Grading and Paving Job

Arute started work in April, 1952, and moved 1,500,000 yards of excavation, laid 46,000 feet of pipe, and placed 184,000 cubic yards of foundation course gravel in one year. Concrete paving started soon after, and in about three months, the 288,000 square yards of pavement were ready for traffic.

Foundation course gravel was obtained from four local pits leased to the contractor. A Bucyrus-Erie 54B and a Northwest shovel loaded 14 Mack dump trucks and 15 Euclid bottom-dump wagons which hauled to the road. Gravel was spread with Caterpillar D8 dozers and compacted with four Buffalo-Springfield three-wheel rollers.

About 10,000 feet of Blaw-Knox 9-inch steel forms were required to keep ahead of the two paving spreads. Forms were set by hand and secured with pneumatically driven pins. Buckeye Finegraders, riding the forms, removed any excess material. The subgrade was then given a final surfacing with a Buffalo-Springfield 5-ton roller.

Identical Paving Spreads

The two paving spreads were identical, each consisting of a Koehring dual-drum paver working outside the forms, a Blaw-Knox spreader with strike-off screed, a Blaw-Knox double-screed finisher, and a Koehring longitudinal finisher.

Because the steel reinforcing mats had to be placed two inches below the 9-inch slab, the paver and strike-off spreader worked together for 50 feet, laying the bottom seven inches of concrete. Then after workmen set the mats, the paver and spreader moved back and laid the top two inches.

Tank trucks pumped water to the paver as a workman hand-hosed the fine-grade. Concrete was mixed for one minute in each drum and then dumped in front of the spreader. After hand finishing, the surface was covered with Sisalkraft curing paper, which was left on for four days.

Batch Plant

Arute's batch plant was set up at about the middle of the job and consisted of a Blaw-Knox three-compartment aggregate bin and a Blaw-Knox 800-barrel cement silo. Aggregates were supplied by local producers and hauled by DeWitt, Inc., Pavilion, N. Y., with a fleet of Fruehauf trailers. Lehigh bulk cement was brought in from Buffalo in Trailmobile 100-barrel trailers. A Cat D8 worked the stockpiles as a Koehring crane filled the aggregate bin. Up to 30 two-batch trucks hauled batches from the plant to the paver.

Using a 1:1¾:3½ mix, including

(*Continued on next page*)

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THE COLORADO FUEL AND IRON CORPORATION

1792

Contractors Speed Thruway Construction

(Continued from preceding page)

4½ per cent air entrainment, a typical nine-bag batch included:

Cement	846 lbs.
Sand	1,500 lbs.
No. 1 and 2 stone	1,450 lbs.
No. 3 and 3A stone	1,460 lbs.

With two paving spreads and about 107 men, Arute laid 4,500 feet of 12-foot-wide lane in 10 hours.

Round-the-Clock Paving

Johnson, Drake & Piper's production also hit as high as 4,500 feet a day, but this was done with one paving spread working two 10-hour shifts. This high production was maintained most of the summer to complete the 8.2-mile contract.

After foundation course gravel had been spread and rough graded, the first operation consisted of preparing a base for the 9-inch Blaw-Knox forms with a Cleveland Formgrader. The tractor-type Formgrader followed a string-line guide as its rotating blades removed subgrade material to the proper width and grade.

When the first lane was poured on each side, about 11,000 feet of forms were required to keep ahead of the paving spread. Pins were driven with two pneumatic hammers powered by a Schramm Pneumatractor. The unit also pulled a wooden sled carrying extra equipment and accessories. A Blaw-Knox fine-grader followed, removing excess material from between the forms. Final compacting was done with a Buffalo-Springfield 7-ton roller.

The paving spread consisted of a Koehring dual-drum paver working outside the forms, a Blaw-Knox spreader and finisher, and a Koehring longitudinal finishes. Because of the night work, each piece of equipment had several lights. Red Devil generators, powered by Wisconsin gasoline engines, supplied light. The paver had four lights, two for illuminating between the forms and two for the skip.

Lamps were also spaced around the batch plant and included two placed on the Koehring crane to illuminate the Blaw-Knox aggregate bin. The plant was set up at about the middle of the job and also included a Blaw-Knox cement silo and auxiliary bins with a capacity of 1,400 barrels.

Aggregates were hauled in from local producers in 18-ton Fruehauf trailers operated by DeWitt, Inc. Lehigh cement was brought in from Buffalo in Fruehauf 90-barrel trailers. From 7 to 13 batch trucks, each carrying three batches, shuttled between the plant and the paver. The batch plant, pick-up trucks operated by key personnel, and the field office were all equipped with Motorola two-way radios.

The Thruway

With the exception of a short stretch north of the New York City line, the Thruway is being constructed as a four-lane divided highway, with provision for two more inside lanes to be built when traffic volume warrants them.

The pavement is reinforced concrete with a 9-inch uniform thickness. The outside shoulder is nine feet wide, and the inside shoulder, seven feet wide. In six-lane sections, the 13-foot center lane is flanked by two 12-foot lanes. Side slopes outside the shoulders are 1 on 4 to 1 on 2 in earth, and 3 on 1 in rock.

Maximum design speed on most of the highway is 70 mph. A 10-mph reduction is used in restricted areas. At 70 mph the vertical sight distance is 1,000 feet, and the horizontal is 600 feet; at 60 mph the vertical sight distance is 800 feet and the horizontal 475 feet.

The minimum right-of-way is 200 feet, and the desirable is 300 feet. Bridge clearances over highways are 14.2 feet. In rural areas, 22 feet of clearance is provided over railroads, and in cities, clearance is 17 feet.

The minimum radius of horizontal curves is 2,800 feet. This figure can be reduced to 2,000 feet in 60-mph zones and 1,500 feet in 50-mph zones. The absolute minimum distance between reversed curves must be sufficient to run out the superelevation; a desirable distance is the same as above plus 500 feet.

Maximum superelevation is ¾ inch per foot, with the rate of change of superelevation not to exceed two per cent of the change in cross slope in 50 feet. Design loading is based on the H20-S16-44 modified standard.

Maximum grade is three per cent. In restricted areas, the minimum mall width is six feet. A minimum of 20 feet is specified in all other areas.

With the exception of several stretches just north of the New York-New Jersey line, the Thruway follows flat or gently rolling terrain. The natural contours of the ground have been used as much as possible to provide difference in grade between opposing lanes.

In cuts, the 13-inch-thick gravel foundation course extends to drainage trenches; it is carried to the edge of the embankment in fills. Foundation course material must be graded as follows:

Not more than	Passing
100 per cent	4-inch
50 per cent	¼-inch
10 per cent	200-mesh

The top 3 inches of shoulder gravel must be:

Not more than	Passing
100 per cent	2-inch
40-70 per cent	1-inch
30-50 per cent	¼-inch
10-20 per cent	200-mesh

The top 2 inches of the gravel

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Joints

Expansion joints are placed every 100 feet. On the western section the Acme expansion joint is used extensively. It consists of a ¾-inch premolded material supported by inverted U-shaped cast-iron legs. One leg has a flat shoe which extends through the joint at ground level to tie the slabs together. The part of the shoe that projects into the opposite slab is covered with a tin sleeve to provide a pocket for movement. The joint is quickly put together in a template upside down, and when completed, it is flipped over into place.

Longitudinal joint supports consisting of 9-inch-long, ¾-inch-diameter bolts are placed every 5 feet, except near expansion joints where the spacing is reduced to one foot. When the first slab is poured, the female end of the dowel is bolted through the steel form. After the pour, the temporary bolt is removed and the dowel for the adjacent slab is screwed into the female end of the imbedded dowel.

Personnel

W. Shull was project manager on Johnson, Drake & Piper's $3,000,000 job. L. Burris was paving superintendent. G. White was resident engineer for the New York Thruway Authority, which is headed by B. D. Tallamy, chairman, and J. B. McMorran, chief engineer.

Arute Bros.' $3,226,000 grading and paving job was supervised by A. Petrone. J. Adams was timekeeper. D. Cooley was resident engineer for the New York Thruway. THE END

Insurance Protection

■ Valuable-papers-and-records insurance and accounts-receivable insurance, two relatively new types of protection for business, are explained in literature available from the Security-Connecticut Insurance Co., Whitney Ave., New Haven, Conn.

The valuable-papers-and-records insurance pays an agreed amount for each listed record or for the replacement of the unlisted records including both materials and labor. Accounts-receivable insurance pays all sums due the insured from his customers which the insured is unable to collect because of loss of records. It includes the extra expense of collections and of establishing the amounts of the accounts at that time. The rates are based on the fire insurance rates where the property is located.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 210.

Clark Co. Office Moves

The southeastern regional sales office of the Clark Equipment Co., of Buchanan, Battle Creek, and Jackson, Mich., has been moved from Norfolk, Va., to 161 Spring Street Bldg., Atlanta, Ga. The firm manufactures industrial fork-lift trucks, towing tractors, straddle carriers, and other materials-handling equipment.

Tailgate-Type Mixer Reheats Old Asphalt

■ A tailgate mixer for heating and remixing stockpiled asphalt patch material is announced by the Wylie Mfg. Co., Inc., 5926 N. W. 39th, Oklahoma City, Okla. The Heat-A-Mix is a compact pugmill and material heater. It is mounted on a tailgate panel that can be quickly attached to a dump truck. The unit is self-contained with its own gasoline engine and propane heating system.

The stockpile or blade-mixed asphalt, carried on the dump truck, is charged into the heat-jacketed charging hopper, prewarmed, and dumped into the hot pugmill. The asphaltic material is heated and mixed in the pugmill before discharging into the material catchpan or onto the road surface. When the job is completed, the tailgate mixer is removed, making the truck available for regular dump-truck service.

The Wylie Heat-A-Mix tailgate mixer.

The Model 30, with a 4-cubic-foot pugmill, has a capacity of 10 tons per hour. The 2-cubic-foot batching hopper has a toggle-action quick-dump gate.

For further information write to the company, or use the Request Card at page 18. Circle No. 247.

Chain-Saw Literature

■ Literature is available on a chain saw made by the Clinton Machine Co., Clinton, Mich. The Model 3A Convincer chain saw is available with 26-inch or 30-inch guidebar. It is powered by a 2-cycle single-cylinder engine and is belt-driven to avoid power loss due to gear friction. Grouped controls, float-type carburetion, and chipper-type hardened chain are other features.

A bow-saw attachment, a helper's handle, and a low-cutting attachment are available. The company also offers an engine replacement plant under which the user may buy the basic engine unit without having to buy the entire chain saw.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 222.

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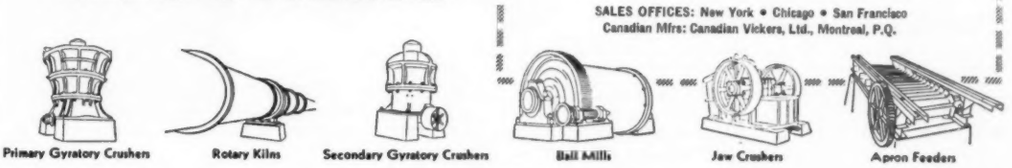

Primary Gyratory Crushers · Rotary Kilns · Secondary Gyratory Crushers · Ball Mills · Jaw Crushers · Apron Feeders

Data on Vibrating Screen

■ A booklet describing Hewitt-Robins' J-type Vibrex vibrating screen is available. The screen is recommended for use in small quarries, roadside contractor's plants, cinder block plants, and for building-construction jobs.

The screen is made in two styles, one with the vibrator located below the screen deck and the other with it located above. Both are made with single deck only and for suspended mounting only. Style J, with the vibrator below, is normally used for coarse screening applications. The screen deck is flat and solidly bolted to the frame. Style JL is normally used for fine or liquid screening applications. The screen deck is arched and fastened to the frame with tension skirtboards.

The booklet describes installations and operation of the screens and gives detailed dimensions and specifications.

To obtain this literature write to Hewitt-Robins, Inc., 666 Glenbrook Road, Stamford, Conn., or use the Request Card at page 18. Circle No. 227.

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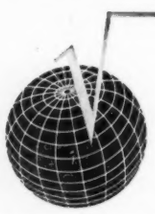

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Weist Is Chief Engineer

Darwin S. Weist, assistant chief engineer of St. Paul Hydraulic Hoist since 1950, has been promoted to chief engineer. Mr. Weist will be responsible for the engineering of St. Paul's complete line of hydraulic hoists, elevating end gates, and underbody road maintainers.

30 miles of timber piling

1350 tons of steel piling

for a single pier
all driven by

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PILE HAMMERS

The new 1200-ft. dock at Morehead City, N. C., is built on soft silt. Timber piles 40 to 50 feet long had to be driven battered as close as possible for the anchorage system. The timber platform behind the bulkhead is supported by timber pile bents, and the bulkhead consists of U. S. Steel MZ-32 Piling 64 feet long.

Altogether, a forest of piles—all driven by McKiernan-Terry Pile Hammers. A McKiernan-Terry 9-B-3 was used for the steel piling and a McKiernan-Terry 9-B-2 drove the hundreds of timber piles. One more project added to the hundreds and hundreds of jobs on which the contractor chose McKiernan-Terry for assurance of speed, dependability, and accuracy in pile driving.

General view of pile-driving operations for new pier at Morehead City, N. C. Steel sheet piling forming bulkhead at left, timber platform for deck over timber pile bents in center, and batter piles for anchorage at right. The illustration also shows the two McKiernan-Terry Pile Hammers in rigs built by the contractor, T. A. Loving & Co., Goldsboro, N. C.

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Plants: Harrison, N. J. and Dover, N. J.

Devices Measure Out Calcium Chloride Additive

The development of devices for adding the exact amount of calcium chloride required to each batch of concrete has made the process a more carefully controlled and safe procedure, according to F. R. Sproule of the Wyandotte Chemicals Corp., Wyandotte, Mich. The improved methods have replaced the earlier haphazard measuring out of the calcium chloride. Often, the tendency on the part of workmen was to follow the notion that if a little bit is good, a lot is even better. Present-day devices guard against these human errors in judgment and reduce the possibility that agglomerates will pass into the mix due to exposure to air. Calcium chloride, like other concrete additives such as air-entraining agents, must be carefully measured out for reliable results.

A good example of where both air-entraining agent and calcium chloride are measured accurately is the Clifton Coal & Supply Company's Brookpark Road plant in Lakewood, Ohio. This plant has three mixers of two-cubic-yard capacity and is capable of turning out 1,000 cubic yards of ready-mixed concrete daily. It employs a system of adding accurate measurements of air-entraining agent and calcium chloride separately in liquid form and in any desired quantity. The operator of the mixer actuates the devices by means of push buttons on his control board. For two and a half years, this installation has been trouble-free, requiring neither maintenance nor replacement.

Mr. Sproule points out that, used in proper amounts, calcium chloride will give concrete qualities such as high early compressive and flexural strength, workability, faster curing, and greater ultimate concrete strength.

Folder on Pipe Cutters

■ New literature describes the new Beaver No. 2 and No. 4 pipe cutters made so that the cutting wheel is fed directly into the pipe. Diagrams illustrate the advantages of this method. Capacities of the cutters are ⅛ to 2 inches, and 2 to 4 inches respectively.

Also illustrated in the literature is the company's Model D aluminum power drive. This unit weighs about 100 pounds and can be carried by one man.

To obtain this literature write to Beaver Pipe Tools, Inc., 1310 Dana Ave., Warren, Ohio, or use the Request Card that is bound in at page 18. Circle No. 301.

Hough Co. Appoints

The Frank G. Hough Co., Libertyville, Ill., manufacturer of Payloader tractor-shovels and tractors, has appointed two new district representatives to work with Hough distributors in the sales and promotion of the Payloader line.

Jack C. Bever will operate the sales district comprising the District of Columbia, Maryland, Virginia, West Virginia, and the Carolinas. Dwain Richey will travel in Arkansas, Louisiana, Oklahoma, Texas, and New Mexico.

Sandblast Nozzle Adds Water to Abrasive

■ A new sandblast nozzle that injects water into the dry abrasive stream to wet it before it is forcibly discharged is made by the Sanstorm Mfg. Co., Santa Clara and H Sts., Fresno, Calif. The Wet Jet venturi-type nozzle is adaptable to any sandblast hose. It gets its water supply from a separate hose connected to any water source including an ordinary faucet.

For further information write to the company, or use the Request Card at page 18. Circle No. 216.

Durable Drawing Paper Is Aluminum-Inserted

■ Aluminum-inserted drawing paper used for original plans and in surveying and mapping is being imported for the American market by Geo-Optic Co., Inc., 170 Broadway, New York 36, N. Y. The material consists of high-quality drawing paper surfaces fused to both sides of an aluminum-sheet insert. Seven grades of the paper are made in which the thickness of the inserts varies from .00118 to .0394 inch.

The paper is available in sheets of any size up to 39 x 48 inches and in rolls up to 36 inches wide and 50 yards long. Another imported paper available from this company is engineer's layout paper said to be not only surface-treated but weatherproof throughout.

For further information write to the company, or use the Request Card at page 18. Circle No. 273.

Data on Adjustable Shore

■ Adjustable steel shores are illustrated in literature from the Waco Mfg. Co., 3565 Wooddale Ave., Minneapolis 16, Minn. The Waco shore adjusts to the necessary fit with from three to six turns of the handle on a screw-type sleeve.

The shore is available in three sizes ranging from 6 feet to 10 feet 6 inches closed. All sizes have a 5-foot adjustment range. It may be had with an 8-inch plate-type head or an 8 or 14-inch J-type head.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 211.

Bidding Guide Available

The second revised edition of "A Suggested Guide to Bidding Procedure", developed jointly by the American Institute of Architects, 1735 New York Ave., and the Associated General Contractors of America, Munsey Bldg., both of Washington, D. C., was recently published. It incorporates changes made since its last printing.

The guide is designed for use in connection with building and related constructions. The first edition was published in 1948, shortly after which the National Joint Cooperative Committee of the AIA-AGC was established. Recommended for use in private work when competitive lump sums are requested, and in public work so far as the requirements of public authorities permit, the guide is regarded as the greatest single accomplishment of cooperation between the two organizations.

The major change in the newest edition involves the situation which arises when a low bidder claims he has made an appreciable error in the preparation of his bid. The revision states the low bidder may be permitted to withdraw his bid if he can support his claim with the owner and the architect. In such a case, the contract is then awarded to the next lowest bidder.

The guide is available from the AIA as Document 333. It can be obtained from the AGC by title. There is no charge for single copies; quantity prices on application.

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Z-type sheeting, 50 feet long, forms the walls of the shaft for Detroit's new interceptor sewer tunnel. Compressors are housed in the Butler prefabricated building in the background. *C. & E. Photos*

Shield-Driven Tunnel Lined With Precast Concrete Blocks

By ALBERT C. SMITH
Field Editor

A 10-FOOT-DIAMETER tunnel for a new interceptor sewer is being shield-driven through the soft blue clay under Detroit, Mich., and lined with precast concrete blocks. Known as the Southfield section of the Northwest Interceptor, the 18,900-foot-long tunnel will begin at the south end of the existing Southfield sewer in the city of Dearborn and extend along a 0.035 per cent grade to the Rouge River in Detroit.

The $5,300,000 job is being done by the Michigan Sewer Construction Co., Detroit, for the city's Department of Public Works. The contractor began the job in March, 1953, and is expected to have it completed by March, 1955.

The first task was to sink a 20 x 27-foot shaft at the middle of the line so that two shields could work in opposite directions toward the ends. Because the sewer grade was about 35 feet below ground level, the contractor decided to use 50-foot-long Z-type steel sheeting for the walls of the shaft. These were driven with a McKiernan-Terry No. 7 hammer

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PHOTO—Pierce & Phelps Bldg., Phila., Pa. Robt. E. Lamb, Contractor.

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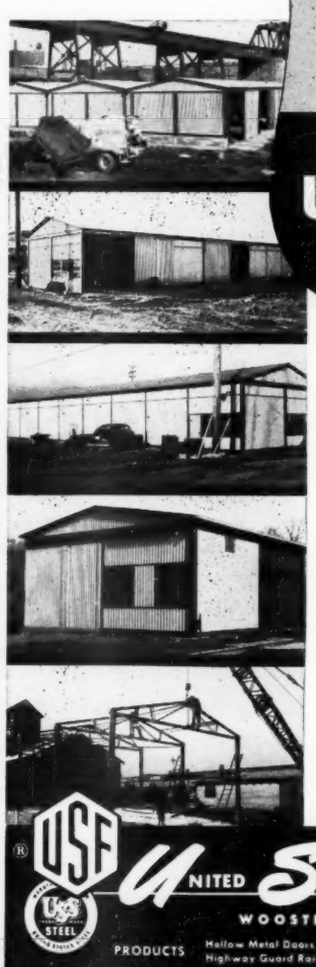

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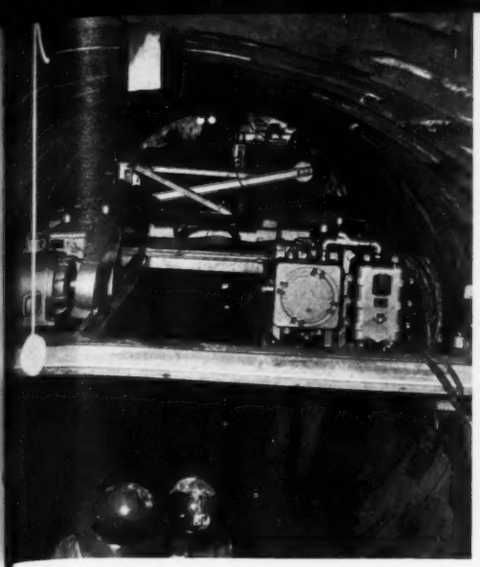

The elevated rail-mounted jumbo supports hydraulic equipment at the rear and a crane at the front. Clearance is provided for men and muck cars.

After being lifted out of a car, a concrete liner plate is set on the floor. Then an erector arm, rotating 90 degrees, picks up and places the plate.

The plate is moved into position. When it is set, Rodgers hydraulic jacks buck against the plate to hold it in place until ring is complete.

that was supplied with air from a Jaeger compressor.

When all the sheets had been driven, the shaft was excavated by a clamshell. As the hole was opened, structural steel wales and knee braces were set in place to hold back the earth pressure. Three levels of 12-inch and three levels of 18-inch beams were used to brace the walls.

After the shaft was excavated and braced, a 2-foot-thick mat of concrete was placed on the bottom. Then the cradle was formed and poured throughout the length of the shaft to provide a base for starting the shields. The remainder of the arch was poured four feet thick at each end of the shaft and the temporary wales removed. With the arch in place, the next step was to extract the sheets on each end just enough so that their bottom ends cleared the arch. The tops of the extracted sheets were then burned off level with the other sheets.

The Shield

Because soft blue clay exists abundantly in the Detroit area, the shield method is used extensively for tunnel work in and around the city. On the Northwest Interceptor job, the method consists of jacking a 12-foot-long steel shield in 30-inch increments as interlocking concrete blocks are set into rings inside the tail of the shield to form the primary lining. Jacks butting against the last completed ring shove the shield ahead for one full stroke length as the clay is forced through

(Continued on next page)

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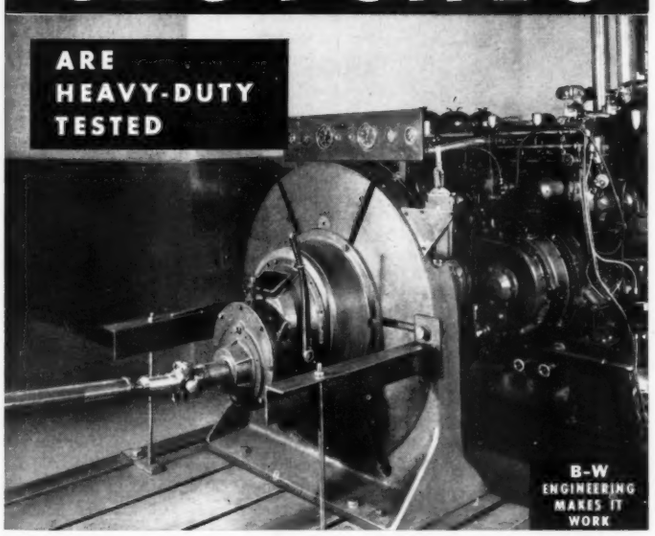

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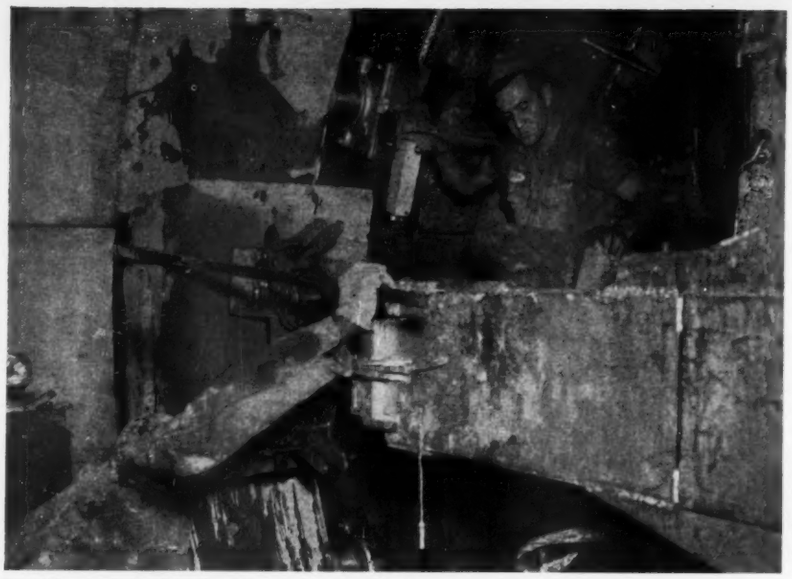

With key plate set and ring completed, the shield is ready for the next 30-inch shove. Each push takes about 30 minutes.

Shield-Driven Tunnel Gets Precast Lining

(*Continued from preceding page*)

ports in the bulkhead. The hard-faced cutting edge on the 15-foot-diameter shield advances through the clay about eight times every shift, averaging about 20 minutes per shove.

The steel shield consists of a 3-inch built-up cutting edge, a 2-inch-thick skin plate, an inner-structure of ring girders and cross members, a tail section in which the liner plates are erected, and a steel and wood bulkhead. Equally spaced around the circumference of the shield are 14 Rodgers 150-ton hydraulic jacks with 30-inch strokes and 5½-inch rams. These jacks push against a one-inch plate in the shield, which is supported by twenty-eight 18-inch I-beams. On the bucking ends of the jacks, 2-inch hardwood shoes fit into depressions in the concrete liner blocks.

This is a typical cycle of shoving and setting the liner blocks: as soon as a ring of seven concrete liner blocks is in place, two workmen at each of the two 11 x 17-inch bulkhead ports position themselves to handle the muck when it begins to push through. Meanwhile, the shield operator checks his bank of hydraulic valves, one for each jack. When everything is ready, all the valves are turned on, the jacks begin to push the shield, and blue clay oozes through the two ports like toothpaste coming out of a tube. As the clay oozes through, one workman cuts off chunks with a wire hoop as another throws them into a waiting muck car.

A two-track system with a switch behind each shield is set up so that one car is always ready to be loaded. As soon as one car is filled, a Greensburg battery-powered locomotive pulls it out to a siding approximately 150 feet behind the shield to make up a train. Then the cars are taken to the shaft where the buckets are hoisted up by a crane and dumped into a truck. During the push, engineers check the line and grade of the advance. If the shield begins to get off line or grade, the pressure on the proper set of jacks is adjusted to steer it back into position. Each 30-inch shove removes about 15 cubic yards of muck, which fills six cars.

When the bucket of muck is dumped, it is loaded with precast concrete liner blocks and sent to the car at the bottom of the shaft. By this time all the jacks have been retracted into the shield leaving room for the next ring of liner blocks.

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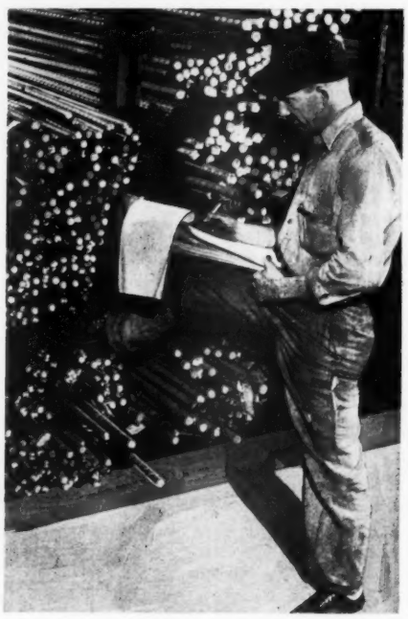

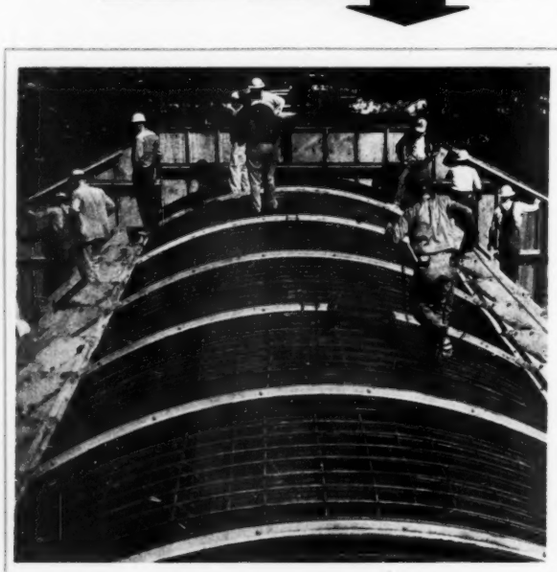

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Handling the Blocks

The concrete blocks are pushed up to the shield, one at a time, in cars. The electric crane above on the jumbo then lifts up the block, swings it out to the center of the tunnel, and sets it down on the floor. Then the hydraulically operated erector arm, which is mounted directly on a trunnion attached to the rear of the shield frame, grips the block by inserting steel fingers into prepared holes, lifts it from the floor, rotates it to the proper position, and then moves it into position. Each block has two kidneys on one side which fit into depressions in the faces of the blocks in the previous ring. As each block is set, a slight pressure is exerted by the nearest jacks to keep the blocks in place until the ring is locked. The erector arm then moves away and rotates to the vertical position to pick up another block. This process is repeated until the key block is set. This consists of two sections having an overall length equal to a typical block. After the last piece has been positioned, a concrete pin is shoved into a groove to lock the two key pieces. Now that the ring of seven blocks is complete, and the 14 jacks already in position, the valves are turned on, the next shove begins, and the cycle is repeated.

With the exception of one 1,800-foot stretch under a marsh, most of the tunnel will be driven without air. In the marsh area, a wellpoint system will be used to lower the water content, and a clay blanket will be spread along the line to permit about 10 pounds of air to be used in the tunnel.

Up on top, the contractor is using a Northwest crane to hoist materials through the shaft, and a General crane to load the concrete liner blocks from the stockpile into the cars.

To operate air equipment in the tunnel, electric-powered compressors are used. Diesel-powered units act as standbys. The permanent equipment consists of two Chicago-Pneumatic 750-cfm compressors and one 200-cfm compressor. Standby com-

(Concluded on next page)

Clay oozes through two ports in the bulkhead as the shield is pushed ahead. Chunks of clay are cut off with a wire hoop and thrown into waiting cars.

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Shield-Driven Tunnel Gets Precast Lining

(Continued from preceding page)

pressors in use are one Jaeger 600 cfm and one Gardner-Denver 215 cfm.

For pressurizing the tunnel, two Ingersoll-Rand 750-cfm and two 1,000-cfm electric-powered compressors are used. One 750-cfm and one 1,000-cfm diesel-powered compressors are used. One 750-cfm and equipment is housed in a Butler prefabricated steel building 96 feet long and 32 feet wide. An annex on the rear contains showers and dressing rooms to accommodate 80 men.

When the secondary lining of concrete is placed behind the precast blocks, a Pumpcrete system will be set up. Concrete will be distributed around the barrel with pipes fed by 10-inch inlets jacked to ground level every 500 feet.

Personnel

A. M. Rossi is general superintendent, T. Skender is superintendent, and V. McIntyre is field engineer for the Michigan Sewer Construction Co. W. Herlihy is resident engineer for the Department of Public Works of the City of Detroit, which is headed by G. Thompson, city engineer. THE END

Prestressed Concrete Is Topic of New Book

A book by Y. Guyon presenting detailed study of some applications of prestressed concrete has been translated from the French and published under the title, "Prestressed Concrete". The aim of the work is to bring out general principles involved in utilizing simply supported beams and to describe some processes which can be suitably modified for other applications.

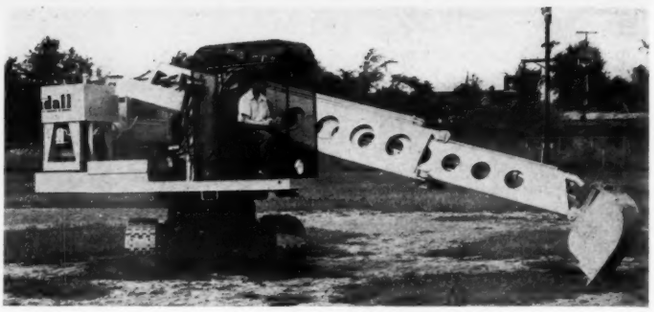
The first section discusses problems arising in the use of statically determinate straight beams, while the second part concerns the elastic design of these beams. A study of various tests on post-tensioned, pretensioned, and rectangular beams concludes the book.

In the United States, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y., is the publisher of the $12.00 volume.

Marlow Appoints Maxwell

William Maxwell has been appointed sales engineer for the New England territory by Marlow Pumps, Ridgewood, N. J. He succeeds William Van Blarcom, who has been made general manager of the company's De Queen, Ark., plant.

An engineering graduate of MIT, Mr. Maxwell has had previous pump experience with both the Blackmer Pump Co. and Fairbanks, Morse & Co. His headquarters will be in Natick, Mass.



The new crawler-mounted version of the Gradall shown with a screen cab enclosure.

Crawler-Mounted Model Of Earth-Moving Unit

■ The Gradall earth-moving machine is now available with crawler-mounting and two extension booms, according to the Warner & Swasey Co., 5701 Carnegie Ave., Cleveland 3, Ohio. The new crawler base enables the machine to work in areas previously inaccessible to it.

A single power source supplies hydraulic oil pressure through a manifold to power both the crawler and the various movements of the upper-structure. The crawler has two speeds, ½ and one mph. Crawler sections are 10 feet long and 8 feet wide with 16-inch treads.

Two new extensions are offered for the machine. The first is a 12-foot extension which, added to the unit's 24-foot boom, extends its working reach to 36 feet. Used with an 8-foot blade, this extension is particularly suitable for grading and sloping operations.

The second, a 4-foot extension, is intended for use with digging buckets up to 24 inches in size. With it, the digging depth of the Gradall is increased from 10 to about 14 feet, and the normal dumping height of 14 feet 9 inches is increased to over 17 feet. The reach of the unit is lengthened from 24 to 28 feet.

The standard Gradall working tools are attached to the end of either extension in the same way they are attached to the regular boom.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 203.

Faster—Safer—Smoother Handling of Materials

● Conveyor System For Meyer Coal & Material Co., Des Plaines, Ill.

● Special 24 inch Channel Frame Feeder Conveyor 27' 6".

For faster and smoother handling of materials for ready mixed concrete plants, the name of Atlas stands out as a leader in the field. Model 24 Conveyors are soundly designed to insure smooth, quiet operation . . . maximum capacity . . . low maintenance costs and easy handling. If you want the best, it's Atlas! Our engineers will be pleased to help you find a satisfactory answer to your conveying problem.

ATLAS CONVEYING AND LOADING EQUIPMENT

ATLAS CONVEYOR CO.,
CLINTONVILLE, WIS.

"ON-TIME" Maintenance *cuts* "DOWN-TIME" REPAIRS!

HOBBS *Engine Hour* METERS

Remove Maintenance Guesswork

You get longer life and longer periods of trouble-free operation when you know the length of TIME your powered equipment has run. A revolution counter can't tell you—it takes a true timing instrument that records HOURS and MINUTES. The HOBBS ENGINE HOUR METER is such an instrument . . . it helps prevent breakdowns and prolong equipment life.

APPROVED BY LEADING MANUFACTURERS

Installed as original equipment and/or recommended by leading manufacturers. Get full information from your factory branch, representative or distributor . . . or write for FREE CATALOG 569.

ORIGINATED AND MANUFACTURED EXCLUSIVELY BY

John W. Hobbs Corporation
2067 YALE BLVD. SPRINGFIELD, ILLINOIS

HOW TO BRING YOUR DE-WATERING SYSTEM UP TO DATE!

Replace your old points with a complete set of "complete" patented fluted tube wellpoints. You will note the higher efficiency and performance of the system on your next dewatering operation. Exclusive design, removes more water in less time . . . Offer many other exclusive advantages in speed of installation, flexibility of operation, substantial cost-cutting economy. Our nearest field-service representative will be glad to show you how little such a change-over costs. Write, wire or phone our home office.

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MACHINERY & EQUIPMENT COMPANY, INC.

36-40 11th Street

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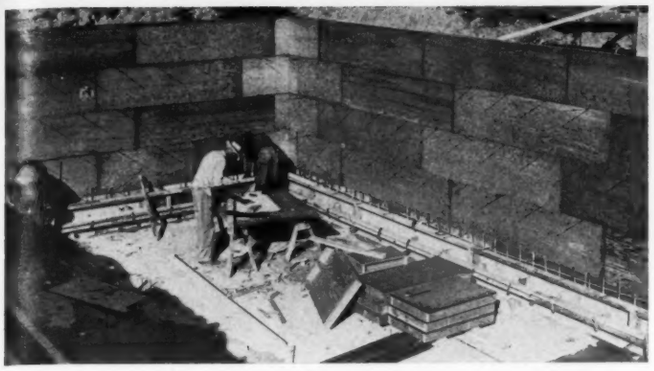


The inside walls of a form show the staggered arrangement of Hart Module form panels.

Module Panel System For Concrete Forming

■ Special panels and hardware for a module system of form erection are available from the Hart Module Form Co., Inc., P. O. Box 137, Oak Ridge, Tenn. Because these forms are made up of a modular arrangement of form panels whose length are a module of the length of the smallest panel, or 2 feet, only the smallest panels need be refabricated to make the corner or angle. Furthermore, as the panels are erected in their interlocking arrangement and are locked to the vertical liners at the vertical panel joint, a double 2 x 4 continuous horizontal waler will occur every two feet of the height of the forms. Thus, horizontal walers are unnecessary in this system.

The panels are made of either plastic-coated or plain ¾-inch plyform with accurately spaced prebored holes. The panels are mounted on 2 x 4 framing. Standard sizes are 2 x 8 feet, 2 x 4 feet, and 2 x 2 feet.

Grooves are cut across the panels to receive the wall tie rods. When the panels are placed, these grooves will occur on 2-foot centers and halfway between the locking yokes. It is pointed out that since the rods are accurately spaced, the same pressure will be exerted evenly on each rod, so that a wavy wall will be avoided.

In stripping, no bars or prys are needed because no nails, spikes, or bolts are used to erect the panels. The metal accessories for this system are simple and have no mechanical parts. Like the panels themselves, they can be used many times. The panels and all metal parts can be purchased or rented, or the manufacturer will furnish a template table for a contractor who wishes to make up the panels himself.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 186.

Blaw-Knox Promotes

The Blaw-Knox Co., Blawnox, Pa., manufacturer of construction and paving equipment, announced the promotions of P. C. Haldeman and H. C. Stirling.

Mr. Haldeman, general superintendent of the Rolls Division, has been made works manager of the Foote Construction Equipment Division. Mr. Stirling, formerly production superintendent in charge of castings at the Lewis Machinery Division, succeeds Mr. Haldeman.

The Foote Division, Nunda, N. Y., produces concrete pavers, blacktop pavers, and asphalt mixers.

Alternate Velocity Blasting Technique

■ A new blasting method that uses charges of low and high-velocity explosive in alternate holes in conjunction with millisecond delay detonators has been developed by the Atlas Powder Co., Wilmington 99, Del. The company reports the new method has often resulted in more breakage per pound of explosive, together with better control of throw. Need for secondary blasting has been diminished greatly. The new system is called "alternate-velocity loading".

In practice, the rock is placed under a powerful twisting stress by the initial discharge of the low-velocity explosive. The high-velocity explosive, detonated a fraction of a second later, hits the fully stressed rock at the moment when maximum shattering action can be obtained. Millisecond delay detonators are used with the two types of charge.

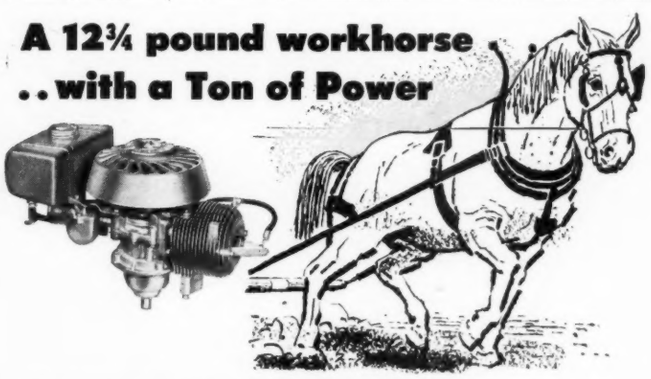
Economy is maintained by the use of low-cost ammonium nitrate explosive which is made to perform as a low, medium, or high-velocity explosive by the insertion of a core of ammonia gelatin during the manufacturing process.

For further information write to the company, or use the Request Card at page 18. Circle No. 280.

A-C Acquires Buda Co.

Transfer of the Buda Co., Harvey, Ill., manufacturer of industrial engines and generators, to the Allis-Chalmers Mfg. Co., West Allis, Wis., manufacturer of construction and earth-moving equipment, has been completed.

A 12¾ pound workhorse .. with a Ton of Power



The POWER PRODUCTS *Lightweight* packs more power per pound

When it comes to lightweight power nothing can touch this engine. Not only is it amazingly lightweight, but it has every important quality feature to assure long, dependable performance

- LIGHTWEIGHT
- MINIMUM EFFORT STARTING
- LONG LIFE, LESS MAINTENANCE
- FULL CARBURETION
- BALL BEARING MAIN BEARINGS
- SEALED DRIP PROOF CRANKCASE
- FULLY ENCLOSED, FLY-BALL GOVERNOR
- NO OIL CHANGING OR CHECKING
- CLOG FREE COOLING SYSTEM

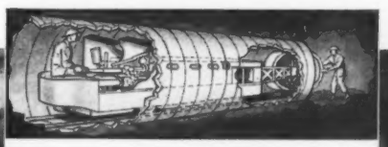
For portable equipment, you can't find a better engine for lightweight and dependability.

be modern - go *Lightweight*

POWER PRODUCTS CORPORATION
GRAFTON, WISCONSIN

Revolutionizing UNDERGROUND SEWER CONSTRUCTION

Inner Circles TUNNELINER PIPE TRADE MARK



Tunneliner pipe of reinforced concrete is pre-cast in oval shape. Full-ring sections are tilted, carried thru the tunnel—added one-by-one as excavation progresses.

48" equivalent sanitary interceptor sewer of oval *Tunneliner* pipe, Covington, Kentucky, built by S. A. Healy-McHugh Construction Co.; engineered by Vogt, Ivers, Seaman and Associates.

Worker guides section carried forward by Lamar *Tunnelugger*.

Section is easily tilted upright on *Tunnelugger* arm.

Section is turned ready for seating by *Tunnelugger*.

NO EXCAVATION AT SURFACE
NO BLOCKING-OFF OF TRAFFIC

Thoroughly proved in tunneling through wet sand, river muck, rock and clay conditions. Men work inside a full-strength structure in maximum safety.

MATERIALLY REDUCES SEWER COSTS

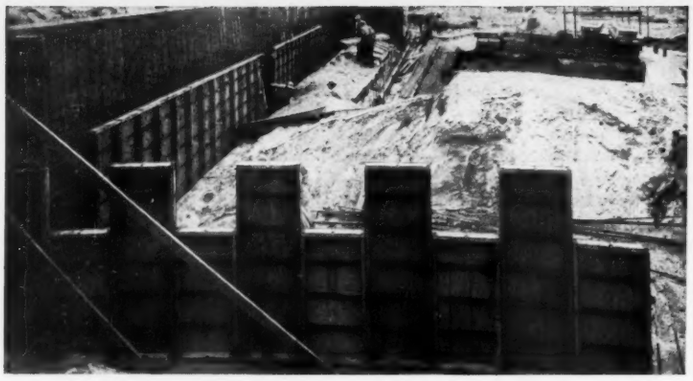
Very little more earth need be removed than that replaced by the capacity of the pipe. Workers learn *Tunneliner* methods the first few hours on the job. Less equipment is needed, yet sewers are completed in faster time. More than 6 miles of *Tunneliner* pipe have already been placed by contractors who two years ago never heard of it.

All necessary equipment is furnished by Lamar at a nominal rental charge, including: *Tunneluggers*, mud cars, track and pipe hooks. Sizes available now—33" through 72".

For complete information—write, wire or telephone

LAMAR PIPE & TILE CO.
Division of American-Marietta Company
GRAND RAPIDS 9, MICHIGAN

Lamar Concrete Products are manufactured at Grand Rapids, Saginaw and Jackson, Michigan; Pittsburgh, Pottstown and Williamsport, Pennsylvania.

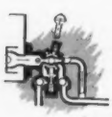


Alexander Hamilton Memorial, Chicago, Illinois, R. C. Wieboldt, General Contractor

Symons Forms with Steel Ribs

Curved 10′ wall is aligned without walers by using alternate 2′ x 6′ and 2′ x 4′ panels with plates top and bottom. Braced on one side only. Same panels reused for straight walls and battered walls. Form work follows form layout made by Symons engineering department from architectural plans.

Send in the plans for your next job and get complete form layouts and job cost sheets—no obligation. Symons Clamp & Mfg. Co., 4251-K3 Diversey Ave., Chicago 39, Ill.



"BAKER FINGERTIP CONTROL **is the best I ever had my hands on," says Allen Knight, Bulldozer Operator of Indianapolis, Ind., "and I've run 'em all. I can feel where the blade is . . . I get better control of my work."**

Talk to operators of Baker-equipped A-C Tractors . . . you'll find they prefer the easy, natural operation of *Baker* Fingertip Control. With the exclusive Baker control-valve system, they can *hold* the blade in any position—without settle or "suck in." Result is *better work*—done with *less fatigue.*

Also important for control sensitivity and accurate blade response is Baker-designed *Direct-Linkage.*

With excess linkage *eliminated,* Baker Blades are *rigid* and *rugged*—with *fewer moving parts that work better and last longer.*

Your Baker, A-C Dealer will be glad to demonstrate!

THE BAKER MANUFACTURING COMPANY · SPRINGFIELD, ILLINOIS

Patch material for winter use is premixed in the summer. Here, a Barber-Greene portable hot plant does the mixing while a Hough Payloader delivers the mineral aggregate. *Ray Day Photos*

Improving Highways In Growing Alaska

Lack of money, hostile weather hamper road commission while need for expansion and better maintenance rises

A Barber-Greene finishing machine lays asphaltic concrete for a halfsole job.

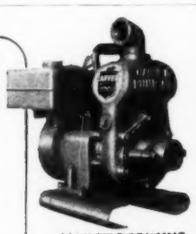
...For PEAK PERFORMANCE On Every Job CARVER PUMPS

If you want peak performance on every dewatering job depend on CARVER!

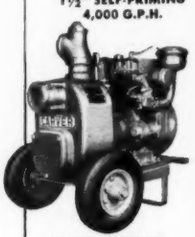
CARVER manufactures the complete line of self-priming pumps from 4000 G.P.H. to 250,000 G.P.H. Every one of these pumps has the same simple design, sturdy construction and rugged durability that mean outstanding performance where jobs are really tough.

Your CARVER DISTRIBUTOR can also supply you with Diaphragm Pumps and a full line of high pressure Jetting Pumps. See him today.

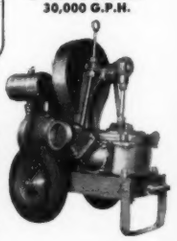
CARVER PUMP CO. 1404 Hershey Ave. Muscatine, Iowa



1½" SELF-PRIMING 4,000 G.P.H.



3" SELF-PRIMING 30,000 G.P.H.



4" DIAPHRAGM PUMP 6,000 G.P.H.

CARVER

the quality name in pumps

It's a never-ending battle to maintain highway embankments like this one which passes close to the marshy bottom of Turnagain Bay on the road to Seward. Workmen do a patch job with a Littleford kettle.

THE AVERAGE MAN'S conception of travel in Alaska might well be that of dog-sled journeys over bottomless snow. It's the wrong picture. Today's Alaska Eskimo is much more likely to be found hurtling around a dangerous curve in a cream-colored convertible.

It is true modern Alaska is still not too far removed from the gold rush days. The present maintenance roster of the Anchorage District of the Alaskan Road Commission lists 160 miles of dog trails and 40 miles of sled roads. Increasingly, Alaska is a land of better and better surface transportation facilities.

The Anchorage District has 1,200 miles of highways, but their development has been accompanied by a constant battle for finances. Practically every mile of road is a compromise between money and engineering. Most of the 1,200 miles is built to 20-foot paved standards. Curves and sight distances—as good as funds will allow—still will not permit high-speed travel.

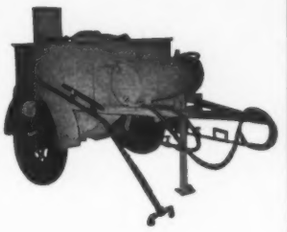
The influx of drivers from the United States with their high-powered automobiles during the past few years hasn't done anything to help the situation. The increasing number of cars on Alaskan highways has seen a corresponding increase in the number of reckless drivers. Hardly a Monday morning passes without newspaper accounts of weekend fatalities.

A recent traffic survey at a main Anchorage intersection showed an average daily traffic flow of 23,000 automobiles. The narrow 2-lane road between Anchorage and Elmendorf Air Force Base carries 13,000 cars daily.

Funds for highway improvement and expansion have been a constant problem. Being a territory and not a state, Alaska must depend directly on congressional grants for funds. These have never been too generous. The present 3-cent tax on gasoline has been in effect for comparatively few years. In spite of these difficulties, the Alaska Road Commission is making steady progress in its expansion and improvement program.

(Continued on next page)

White Heating Kettles Have Fire-Proof Tops



Cut-back and highly inflammable road repair material can be heated safely in White kettles. FIRE-PROOF top reduces fire hazard.

White asphalt and tar kettles are extensively used. They give long life and satisfaction.

Plain kettles or with hand or engine driven spray pumps for patching pavement. Thermometer, barrel hoist, warming hood extra All oil burning. Semi-elliptic springs, pneumatic tires.

65, 110, 165, 220, 300-gallon capacities.

Model F-10 is oil jacketed, to heat elastic joint filler.

Write for Circulars and name of nearest dealer

White Mfg. Co.

ELKHART 9 INDIANA

Other Products

CONCRETE VIBRATOR
Gasoline Engine and Electric Motor Driven Model

ASPHALT PLANTS
Portable—Stationary

FRONT END LOADERS
for Industrial Tractors

KEROSENE TORCHES
3 to 20-gal. capacities

the hottest and the safest

MASTER AMERICA'S No. 1 BUY

OPEN CYCLE SPACE HEATERS in the world

Master Model B-160 Super-Space Heater high output for smaller heating jobs

Master Model B-240 Super-Space Heater for larger heating assignments

Master Model B-400 Super-Space Heater to meet extra big heating requirements

3 quality Master-made units to meet every need

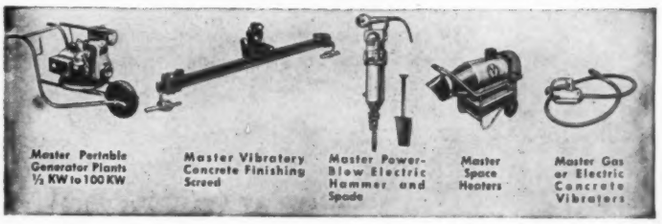
NEW MASTER SUPER-SPACE HEATER SPECIFICATIONS

MODEL NO.	CAPACITY	*SAFETY	BURNER	FUEL
B-160	160,000 BTU per hour	Indications of carbon monoxide in the exhaust gases of the kerosene fueled Master Space Heater was less than 0.001 per cent by volume . . . as tested by an independent testing laboratory. According to accepted standards this content is one tenth of the amount considered hazardous.	Master Gun Type	Kerosene, No. 1 Fuel Oil or No. 2 Fuel Oil
B-240	240,000 BTU per hour			
B-400	400,000 BTU per hour			

(Continued)	FUEL CONSUMPTION	HOT AIR OUTPUT	CONTROLS	SIZE	WEIGHT
B-160	1.14 per hr.	1100 C.F.M.	Thermostat for full automatic temperature control. Fuel tank safety control.	W-24½" L-58" H-34"	166 lbs. less fuel
B-240	1.71 per hr.	1900 C.F.M.	Thermostat for full automatic temperature control. Fuel tank and burner safety control.	W-29" L-60" H-39"	250 lbs. less fuel
B-400	2.85 per hr.	3500 C.F.M.		W-33" L-72" H-45"	311 lbs. less fuel

• *See your dealer today*

MASTER VIBRATOR COMPANY • DAYTON 1, OHIO



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Convert your shop air line . . . into High Hydraulic Pressure!

WITH *WATSON-STILLMAN* DOUBLE ACTING AIR ENGINE PUMP

Connect this light efficient, portable unit to your low pressure air line. Result — Pressures for all types of Hydrostatic testing.

Can also be used for operation of small Hydraulic machinery and jacks. Available in discharge capacities up to 6000 p.s.i. Write for literature.

WATSON-STILLMAN FITTINGS DIVISION
H. K. PORTER COMPANY, INC.
ROSELLE, NEW JERSEY

Winter maintenance and snow plowing mean the same thing. Here a big rotary creates its own little blizzard. Certain sections of road get as much as 86 inches of snow in one winter.

Alaska Highway Commission Photo

Improving Highways In Growing Alaska

(Continued from preceding page)

The Anchorage district is currently in the midst of a huge paving program which it started in 1948 and hopes to complete by 1955. Pavement on the mainline highways is closing fast despite the fact that most highway engineers realize the roads will have to be improved further if automobile traffic increases. There are now paved sections of comparatively modern highway from the U. S.-Canadian border to Big Delta Junction, and a good highway also joins the U. S., Fairbanks, Valdez, and Seward areas. In the not-too-distant future, McKinley Park will be accessible by automobile from points in the United States.

A new highway is being pioneered from McKinley Park to Paxson. This paving consists of hot-mix bituminous concrete placed by contract. Roadbeds for this highway were graded either by contract or by hired labor and force account, administered directly through the Alaska Road Commission.

The maintenance organization at Anchorage works directly under the supervision of District Engineer E. J. White and his assistant, L. A. Hatchett. A district chief of engineering takes care of engineering and contracting work, directly under White and Hatchett, and has resident engineers for construction and contract work.

Maintenance Forces Separate

The maintenance forces, however, are separate units. Highway maintenance is divided into four general areas, one at Kenai, one at Anchorage, one at Cantwell, and one covering isolated road areas generally. These isolated road areas consist of permanent stations in such towns as Bethel, Perryville, Ophir, Talkeetna, Dillingham, Flat, and Naknek, many of which are mining towns with limited highway networks that serve only the local areas. Maintenance men who work in these isolated areas have more or less steady jobs and live in the center of their small highway networks. Many of the isolated road areas are accessible only by plane or boat.

Visits by the district engineer and his staff and the shipment of equipment is dictated by the transportation limitations. One of the surest things in a maintenance foreman's mind in an isolated area is the improbability of losing his equipment through a sudden inter-district transfer.

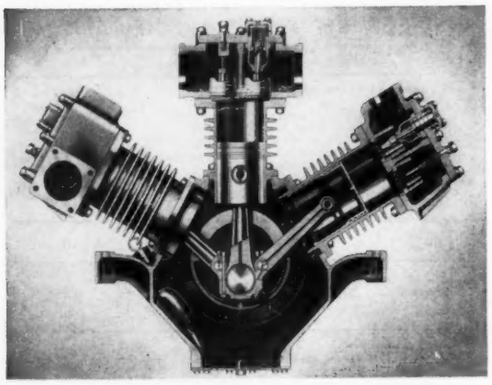
Each maintenance area is under the supervision of a general foreman who correlates maintenance effort and standardizes the work. In isolated areas, maintenance is under direct supervision of the maintenance foreman, who in most cases is enough of a mechanic to keep his

If you believe ALL COMPRESSORS ARE ALIKE...

SIZE	CUBIC FT. PER MIN.	ENGINE H.P.	H.P. RESERVE	% RESERVE
600	134	202	68	33.7
315	75	117	42	35.6
210	51	78.5	27.5	35
160	37	57	20	35
105	25	42.5	17.5	41.6

check these three points

1. RESERVE POWER. There's plenty of that built into every Blue Brute. That means it takes thousands of hours of normal operation before engine wear affects the compressor's output.



2. EASY MAINTENANCE. All parts of the Blue Brutes are readily accessible. No special tools or complicated disassembly procedures are needed. And the compressor uses the same oil as the engine.

60'	GASOLINE	1.31	1.42
105'	GASOLINE DIESEL	2.16 1.66	2.35 1.73
160'	GASOLINE DIESEL	3.18 2.45	3.44 2.60
210'	GASOLINE DIESEL	4.32 2.89	4.70 3.06
315'	GASOLINE DIESEL	6.25 4.38	6.75 4.64
600'	DIESEL	6.30	9.20

3. FUEL ECONOMY. How does your compressor stack up in comparison with the Blue Brute for economical fuel consumption? The figures shown have been determined under normal field operating conditions.

Get all the facts about the Blue Brute from your nearest Worthington distributor. Or write to Worthington Corporation, Construction Equipment Division, Section H.3.6, Plainfield, New Jersey.

WORTHINGTON

H.3.6

IF IT'S A CONSTRUCTION JOB, IT'S A BLUE BRUTE JOB

ROCK DRILLS • WAGON DRILLS • PAVERS • CONCRETE MIXERS • PORTABLE PUMPS

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Further information or descriptive literature can be secured from any advertisers in this issue of CONTRACTORS AND ENGINEERS. Just write name of manufacturer and product of interest to you on the extra line provided on the post card facing page 18, fill in your own name and industry connection, mail to us and we'll do the rest.

CONTRACTORS AND ENGINEERS

470 Fourth Avenue, New York 16, N. Y.

equipment in shape. Equipment in the isolated areas generally consists of a small tractor, a tractor loader, several trucks, a small motor grader, and a few snowplows.

In the larger maintenance areas like Anchorage and Kenai, maintenance equipment resembles that seen in any highway setup of the midwest. On the equipment inventory of the Anchorage District are 500 pieces of major equipment assigned to maintenance. The list includes everything from Caterpillar D8's and 1½-yard shovels down to asphalt pots for spot maintenance. In the three warehouses belonging to the Anchorage District is $500,000 worth of equipment parts stocked for instant use.

Although many of the maintenance men have permanent civil service status, much of the work is sufficiently seasonal so that men are hired on the spot in spring and are laid off in the late fall after summer maintenance is over. For this reason, the wage scale is somewhat higher than average in a Government department, and many excellent men offer their services. The Alaska Road Commission is becoming an increasingly attractive place for construction workers, especially in the Anchorage area, because steady work under union regulations is too uncertain and the long-time benefits are not as great. Many farsighted construction men, watching Alaska's growth and analyzing its potential, realize the highway network cannot help but expand, especially when Congress and the people of the United States begin to realize more fully the economic and strategic importance of the territory.

Maintenance Methods

Alaska Road Commission is as ... a victim of transportation difficulties as any other agency attempting construction in the arctic territory. Parts, materials, and supplies are just as hard for the Commission to get as groceries are for an uptown Anchorage supermarket.

The Anchorage District has practically confined itself to RC-3 asphalt for use in plant-mixed bituminous surfacing because tankers will not handle a stiffer asphalt in bulk. The only way stiffer asphalt can be shipped in is in drums, and the unloading and opening of these drums makes the cost of that material nearly prohibitive.

At the 3-block site in which the Anchorage District headquarters is located, all the maintenance equipment is stored and serviced for the immediate area. Isolated-area equipment, of course, stays where it is assigned. At Anchorage Harbor there are five 10,000-barrel asphalt storage tanks, where asphalt can be unloaded from tankers and stored for use. Here, boilers and steam facilities for heating the material are available so that the asphalt can be used in the conventional manner.

In general, maintenance methods are little different from those in the northern United States. Some of the highway embankments are trickier to maintain because of bad marshy conditions generally more peculiar to Alaska than to the United States. Many of these roadbeds on raised embankments were allowed to settle out, so that by the time asphalt paving was placed, the highways were in fair shape.

Most of the thicker, high-type plant-mix highways laid in recent years are standing up comparatively well. Except for surface patching, shoulder maintenance, slide removal, and winter snow and ice work, the maintenance job has not yet reached the point of diminishing return as it has in many places in the United States. A great deal of spot-patching is being done as the frost leaves the ground in the spring. The district has its own small Barber-Greene hot-plant, which it uses during the summer months to premix patch material for winter use. Such patch material, delivered in the summer, is stockpiled in storage areas close to the hot-plant and loaded out in the spring.

A considerable amount of sealcoat work is being done on asphalt highways. This, too, is similar to work done in the United States. Rock aggregates for chips are produced either by district crushers or by equipment owned by other agencies. In cases where the U. S. Army is involved on defense-base access roads, army plants and crews often produce the aggregates for Alaska Road Commission maintenance use. A recent halfsole maintenance job on the Anchorage-

(Continued on next page)

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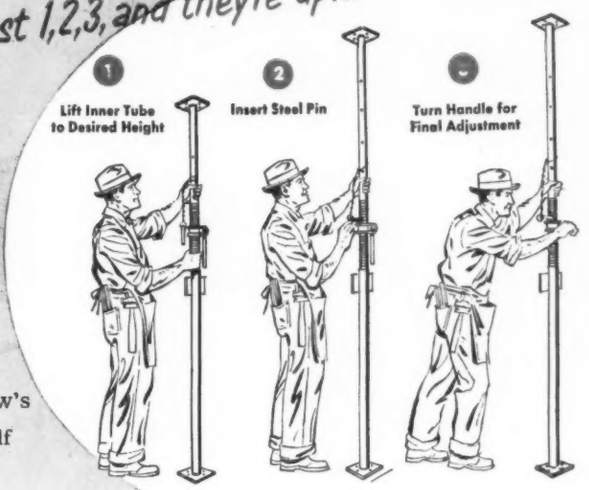

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Improving Highways In Growing Alaska

(*Continued from preceding page*)

Elmendorf base highway was batched out of the Army hot-plant at Elmendorf and laid down by district maintenance crews.

Possibly one of the worst maintenance problems is the upkeep of gravel highways which now are beginning to carry much more traffic than was ever expected. Some of the farm-to-market roads, especially in the Palmer area, are being pounded to pieces, and the regular blading and replacement of gravel on these highways has long since reached a prohibitive point. The one obstacle that every Commission engineer faces is the uncertainty of traffic requirements in the future.

At the present time, these gravel roads are grossly overloaded with a high traffic count. What conditions will prevail when air bases and army posts are completed is not known. The best the maintenance engineers and crews can do is maintain the roads as intelligently as possible. That means spending a lot of money for motor grader operators, equipment, and replacement gravel.

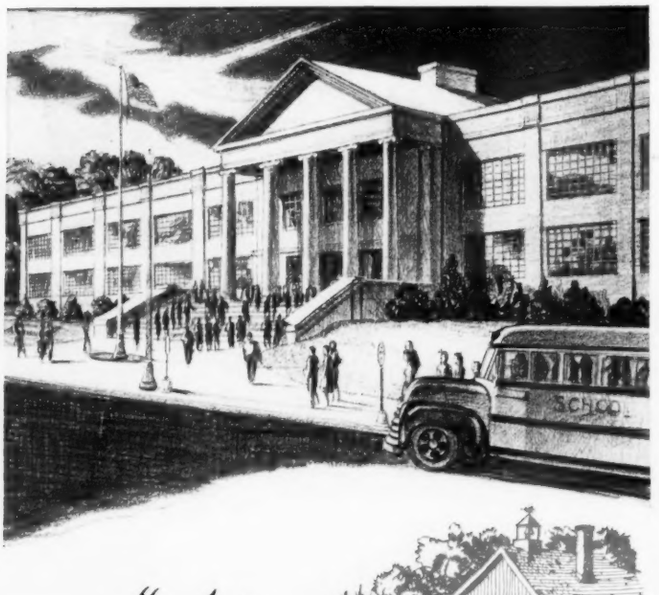
On the basis of average daily traffic counts, many highways in Alaska qualify for four and even six-lane divided standards. The current maintenance battle revolves around one big question: Is the present condition a temporary one? Realizing this, highway engineers are trying to make the roads hold up until the big defense push is over.

Snow and Cold Weather

One of the most severe maintenance problems is the removal of snow and ice and the repair of frost-boil damage in spring. Some of the winter conditions are abnormally severe. One mountain pass just outside the Anchorage District received 83 feet of snow last winter. It is not at all unusual in certain parts of the district to see temperatures fall to 50 or more degrees below zero, even though a 30-below day in Anchorage is uncommonly cold. In some parts of the district, wind velocities reach a point where snow-fences anchored on steel posts are flattened. The winds twist the steel posts flush with the ground. The weather is so cold in many parts that water, seeping out of an adjacent hillside, builds a glacier across the highway. Unless the ice is intercepted, it can soon block a highway completely.

One of the worst winter situations is on the Anchorage-Seward highway near the head of Turnagain Bay, where heavy snow slides threaten the highway, the railroad, and all persons using these facilities each winter. The slide problem at Turnagain Bay is further complicated by the fact that no set pattern can be predicted. In Colorado, by comparison, highway engineers can predict trouble year after year at practically the same spots along the Seven Sisters slide area. At Turnagain Bay, a slide which comes down at one point one year may very likely move over a thousand feet the next year.

District maintenance men are fighting the snow and ice with every trick at their command. Routine maintenance consists of push plows, V-plows, and rotaries. Rotary plows include everything from the large multi-augered Bros to the smaller



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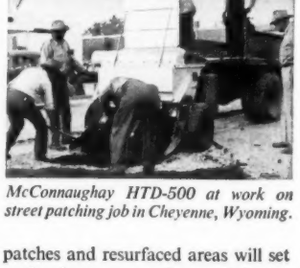

McConnaughay HTD-500 at work on street patching job in Cheyenne, Wyoming.

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models of Snogo plows. For push plow work heavy V-plows and V's mounted on motor graders have proved especially valuable in breaking up deep drifts. In some of the high-wind areas, such as at Dillingham, 8 and 9-foot snowdrifts have been known to form in a matter of minutes.

Until a few years ago, the transportation of snow-fence to the isolated maintenance areas was a considerable and expensive problem because of the room these fences occupied on boats. Two years ago, however, an experimental program was started with paper snow-fences. These consist simply of rolls of Sisalkraft paper, reinforced with asphalt and jute. The paper is unrolled and fastened to wood posts which can be cut in practically all the isolated maintenance locations. The paper snow-fences have worked far better than regulation barriers set on steel posts. They have stood up without damage in areas where steel posts formerly twisted off at the base by wind pressure. These paper snow-fences are set up in late August and early September so they will be in place when the snow begins to fall.

Paper and sheet metal has also been used quite successfully to intercept the highway glaciers. In places where glaciers formed, posts are set in place early in the fall, and either sheet metal or paper baffles are placed to intercept the ice pack. As the glacier builds out, it forms a square face against the paper or metal. After it builds up considerably, the outer part freezes and the ground seep stops. There have been some cases, however, where the glacier kept on forming. In these instances, motor graders with serrated blades, dozers, and even drilling and powder had to be used to get the ice out of the way.

The slide problem at the mouth of Turnagain Arm is one of the most dangerous winter conditions in the district. Highway alignment at that point was so difficult that the roadbed had to be cut through sheer rock in many places. The highway also parallels the Alaska Railroad. In fact, the highway in some spots is on the old Alaska Railroad roadbed, while the railroad is on a new embankment alongside, facing Turnagain Arm.

To remove snow from the highway, it is often necessary to throw snow over on the railroad. Any bad slide makes a cooperative effort necessary between the Alaska Road Commission and the Railroad. There have been slides so bad that rotary plows belonging to both agencies have often worked together for days handling snow and slide debris fed into the machines by dozers and tractors. The snow is blown over to the Turnagain Arm side.

Nothing is quite so brutal on equipment as an Alaskan winter. With temperatures well below zero, strain loads are imposed on metal mechanical parts which the equipment was never designed to withstand. A rotary plow working in a heavy slide loaded with rocks or stumps is due for serious trouble the instant its augers bite into one of these solid obstructions at 30-below zero. To minimize this hazard, all snow plowing equipment is thoroughly reconditioned each summer so that it will be in topnotch condition at the start of the winter season. A plentiful supply of the more expendable parts is also stocked so that breakdowns can be repaired on the job as quickly as possible.

Winter snow removal and maintenance personnel are organized on the crew system, with the maintenance foreman on patrol throughout his assigned section. The district also uses a radio communications system, which aids in emergencies and on routine work.

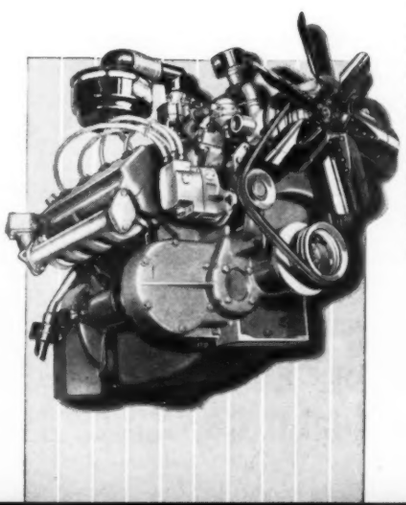
Peculiar to Alaska is the amount of attention given to the maintenance of sled roads and dog trails. Bridges on sled roads are mostly of rustic

(Concluded on next page)

Main yard of the Alaska Road Commission at Anchorage. All maintenance equipment for the immediate area is stored and serviced here. *Ray Day Photo*

Photo courtesy Hale Fire Pump Company, Conshohocken, Pa.

Chrysler Power provides modern solution to age-old problem of irrigation



Early last summer, the owner of this 640-acre farm near Williamsburg, Virginia, decided to irrigate 120 acres. Taking his water from the nearby James River, he irrigated 70 acres of corn, 50 acres of soy beans. Water was pumped at the rate of 960 gallons per minute, fourteen hours a day, seven days a week. Each acre required approximately 36,000 gallons.

The results were astounding. Not only did this farmer save his crops during an especially dry summer, but his corn and soy bean yields actually *increased* 100% over the year before. In each case, 1952 was considered a normal year.

What this farmer did with his Hale Model CIRV Pump demonstrates again the effectiveness of Chrysler Power. Here the 331-cubic-inch displacement Model 20 V-8 Engine is used because the manufacturer wants great power with light weight, continuous, economical operation.

Manufacturers find Chrysler Engines ideal for almost any equipment requiring extra power without extra weight. Manufacturers also find they can order engines equipped *by Chrysler* to meet the needs of the equipment and their customers. For example, Chrysler Engines can be supplied with gasoline, natural or liquid propane gas burning carburetors, standard or gear-driven front ends, 12 or 24 volt electrical system.

Chrysler Industrial Engines are not expensive. Production line methods, adapted to specialized industrial engine building, provide a custom-built engine at mass-production prices. See a Chrysler Industrial Engine Dealer, or write: ***Dept. B11, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

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Improving Highways In Growing Alaska

(Continued from preceding page)

timber construction, but they are kept in a good state of repair so that important dogsled communication and travel can go on all winter.

The maintenance and construction work in other Alaska Road Commission districts is carried on in a manner similar to what is being done in the Anchorage District. About 90 per cent of highway maintenance and construction is done by the Alaska Road Commission. The remainder—those roads within national forests—is under the supervision of the U. S. Bureau of Public Roads, Department of Commerce.

The automotive age has caught up with Alaska's highways. Although the general highway system is far better than most people in the U. S. believe, it is still not adequate for the transportation job Alaska faces, and will be less adequate if territorial development continues. But Alaskan highway engineers are not discouraged. They foresee a network of adequate surface transportation facilities designed for year-round use throughout the territory. The main highway between Anchorage and Valdez remained open all last winter though 83 feet of snow fell on it in certain spots.

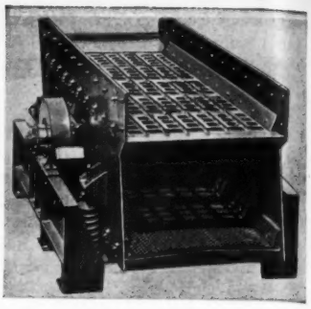
Sub-zero temperatures and long arctic nights are no longer barriers to crews as they push ahead to construct and maintain a highway network in answer to the ever-increasing public demand. THE END

Vibrating Screens

■ An expanded line of Mesabi-type vibrating screens for scalping and sizing is announced by the Pioneer Engineering Works, Inc., 1515 Central Ave., S.E., Minneapolis 13, Minn. The company offers single and double-deck units four to six feet wide and 10 to 14 feet long.

In the two-deck scalping screen, the top deck is ½-inch punched plate and the bottom deck is wire mesh. The single-deck screen has a ¾-inch punched-plate deck. In the two-deck sizing screen, both decks are of wire mesh. Standard punched plates have square openings ranging from two to eight inches in size in ½-inch increments.

The main frame on all the units has been redesigned and the manufacturer reports vibration has been reduced to a minimum without restricting the action of the screen pan.



A Pioneer Mesabi scalping screen.

For further information write to the company, or use the Request Card at page 18. Circle No. 263.

Metallizing Machine

■ A metallizing machine that renews metal surfaces at a fraction of replacement costs is announced by Vandersee Engineering Co., Inc., 727 W. 7th St., Los Angeles, Calif. The Vanco metallizing machine has a new nozzle that eliminates the need for manual adjustments by the operator and is said to assure an even flow of metal to the surface being covered.

The machine is constructed so that all bearings for the wire-feed mechanism are encased in the main body gear-case casting. This allows repairs to be made by semiskilled workmen on the job. Also, the gas-mixing chamber is built into the nozzle at the point of combustion to eliminate backfiring.

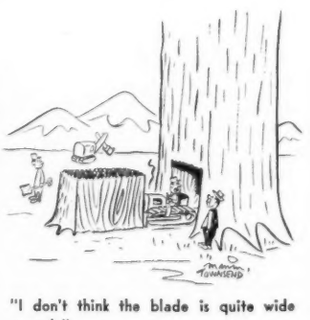
For further information write to the company, or use the Request Card at page 18. Circle No. 180.

Soil-Cement Testing

■ Shortcut soil-cement testing procedures for sandy soils is the subject of a booklet from the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill. The new publication explains procedures said to reduce the amount of work previously required in testing soils for soil-cement paving construction.

Included in the booklet are 10 charts on cement content, moisture content, and density of soil-cement. These charts are planned to reduce the laboratory technician's work by showing the amounts of materials to use for individual tests. Use of the charts does not involve new tests or additional equipment.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 271.



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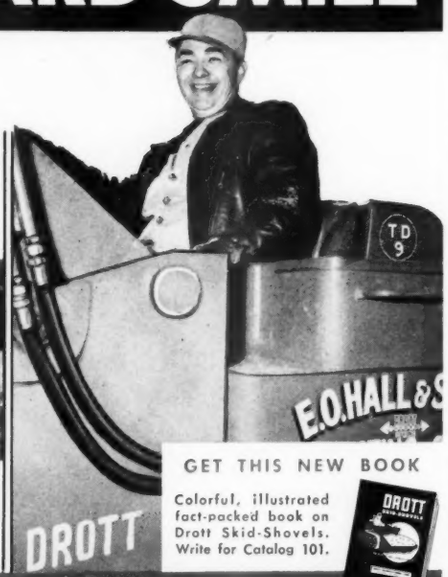

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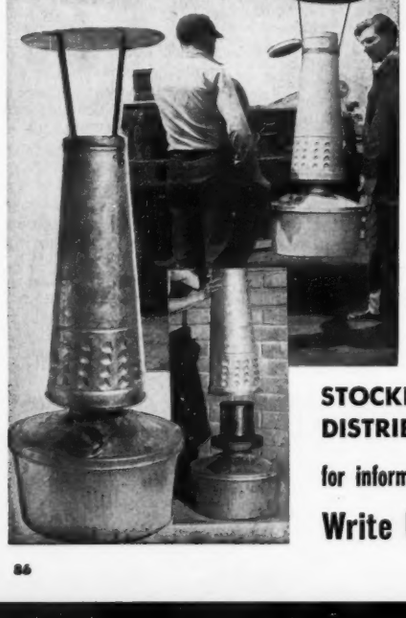

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The new adjustable tilt-up slab brace made by Superior Concrete Accessories, Inc., 4110 Wrightwood Ave., Chicago 39, Ill., has a pivoting action and is used with 2 x 4's or 2 x 6's of standard lengths to fit individual jobs. The brace is also available with fittings for use with pipe instead of lumber. For further information write to the company, or use the Request Card at page 18. Circle No. 195.

Cold Season Motor Oil

■ A high viscosity-index motor oil for cold-weather use in trucks, tractors, and automobiles, is announced by the Gulf Oil Corp., Gulf Bldg., Pittsburgh 30, Pa. It is recommended for use wherever temperatures of 10 degrees F or below may occur and is said to give easy starting in temperatures down to minus 30 degrees F without kerosene dilution.

According to the manufacturer, the new motor oil meets, in a single oil, the classifications of the Society of Automotive Engineers for 5W, 10W, 20W, and 20 motor oils. The company announces it will no longer market a regular 5W grade and has discontinued its 10W grade of Gulfpride H.D.

For further information write to the company, or use the Request Card at page 18. Circle No. 278.

Diamond Drill-Bits

■ A booklet on diamond drill-bits is available from Anton Smit & Co., Inc., 333 W. 52nd St., New York 19, N. Y. The booklet lists specifications for a variety of sizes of core bits, casing bits, casing shoes, reaming shells, and non-coring diamond drill-bits.

A diamond-impregnated drill-bit with an even distribution of diamond particles throughout the entire matrix crown is also illustrated. This drill-bit is especially useful whenever badly broken, extremely hard formations may cause dislodging of the whole diamond stones found in conventional bits.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 246.

Lettering and Drawing Pen

■ Literature is available on a new fountain pen for lettering and drawing. The Pelican Graphos pen is available with 58 interchangeable nibs for a variety of work, including technical and free-hand drawing, sketching, art lettering, and stenciling.

To obtain this literature write to John Henschel & Co., Inc., 105 E. 29th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 224.

Grooved-Pipe Coupling

■ A new lightweight coupling for grooved pipe systems is announced by the Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City, Mo. The Gruvajoint coupling, which can be used where pressures do not exceed 500 psi, can be applied quickly and can be reused indefinitely. The coupling is suitable for permanent or temporary lines carrying air, vacuum, oil, water, gases, or pulverized minerals and rock.

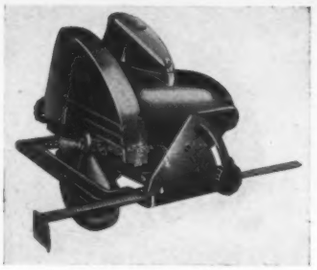
The new coupling automatically absorbs expansion and contraction, shock, ground motion, and vibration. It is said to remain leak-proof under end-pulls up to 7,500 pounds and to permit layout misalignment up to 3 degrees. The coupling withstands temperatures between 200 degrees and minus 65 degrees F.

A green rust inhibitor protects the surface of the malleable-iron coupling. Sizes available are 2, 3, and 4 inches.

For further information write to the company, or use the Request Card at page 18. Circle No. 232.

Portable Rotary Saw

■ A portable 7-inch lightweight rotary saw that will cut a variety of materials has recently been announced by the Ram Tool Corp., 411 N. Claremont Ave., Chicago 12, Ill. The Power-Guide saw will miter a 2-inch plank at 45 degrees and has a shoe adjustment for slotting from ¼ to 2⁷⁄₁₆ inches deep. A one-hp air-cooled motor in an aluminum housing powers the 11½-pound saw.



The 7-inch Power-Guide saw.

With special blades, the saw will cut steel, tile brick, concrete, or corrugated metal. The motor is placed to the left of the blade for better balance and control.

For further information write to the company, or use the Request Card at page 18. Circle No. 257.

HOPKINS VOLCANIC UNITS Help Set "Fireball" Pace on New Jersey Turnpike Project

The 118-mile New Jersey Turnpike is the biggest paving project of its type in the world, and the longest asphaltic-concrete job ever undertaken on so short a schedule. With only 5 months actual working time, and tough spex to meet, a terrific production schedule had to be maintained. So, to supply concrete for Sections 3 and 4, four huge asphalt plants were erected at Cranbury. Sitting side by side, each plant turned out 2-ton loads every minute. That's 8 tons a minute, or almost 500 tons per hour . . . a really "fireball" pace!

The four asphalt plants were all equipped with Hopkins Volcanic Dryer units, and Mr. John McGarry, Vice President of the Tioga Construction Company, later wrote us as follows: "We were producing 25,000 tons of asphalt paving material a week. We found the Hopkins equipment does its assignment efficiently and with a minimum of maintenance."

Contractors throughout the country are setting new production records, and cutting costs, with Hopkins Volcanic Units. Want to know more? Your letter or phone call will bring descriptive literature, complete details, and follow-up by a Hopkins representative.

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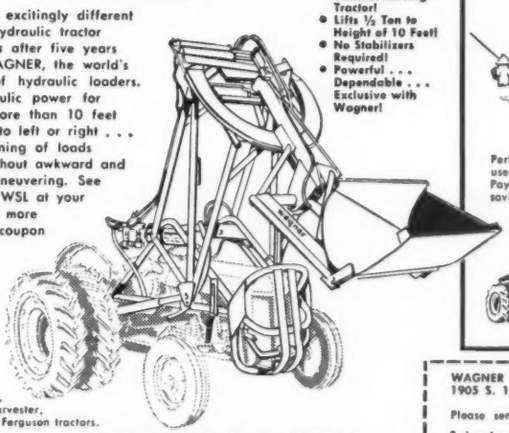
Currently available for all popular models of Allis-Chalmers, J. I. Case, John Deere, International Harvester, Min.-Moline, Oliver, Ford & Ferguson tractors.



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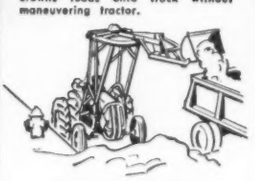

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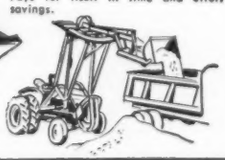

Most Standard Wagner Attachments Will Fit: Crane, Plows, Fork Lift, Coal Bucket, Snow Bucket, Backfill Blades, and more to come!

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Three prize-winning bridges and one meriting honorable mention in this year's Aesthetic Bridge Competition sponsored by the American Institute of Steel Construction are shown here. Above is the **Neches River Bridge** in Beaumont, Texas, winner in Class II, open to bridges with spans under 400 feet and costing more than $500,000.

The Morris Ferry Bridge in Tennessee was awarded first prize in the Class III category. This classification includes bridges costing less than $500,000 and having spans under 400 feet in length. It was selected because its design is "coherent and restful and is achieved with great simplicity."

FATHER WASHINGTON BRIDGE

Night becomes day with super-modern lighting. P & K All-Aluminum standards are mounted on steelwork and have 30 foot mounting heights with 6-foot tapered elliptical arms.

the* P&K *story

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The New Jersey Turnpike is a twentieth century miracle of highway design, engineering and construction. Here is one hundred eighteen miles of continuous road ... without a single traffic light or crossroad!

Within one year after its lanes opened, the "Pike" carried the amount of traffic predicted for the year 1968 ... and its safety record is better than parallel public highways in the state as well as most public roads in the nation.

This great national artery employs every known improvement and device to provide maximum safety for its users ... and its facilities are being expanded to meet increased traffic demand.

Lighting, modern and efficient, turns night into day on the New Jersey Turnpike ... and Pfaff & Kendall is proud to have been chosen as the original supplier of all highway and area lighting facilities throughout the entire 118 mile length of the highway. P & K All-Aluminum Standards and Arms have been specified and thus far have been the only type installed.

P & K ALL-ALUMINUM Standards and Brackets are Produced in Design and Types to Meet any Street, Road or Highway Requirement. They are Always the Wisest Investment ...

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.... easily salvaged and re-used *in event of knock-down*

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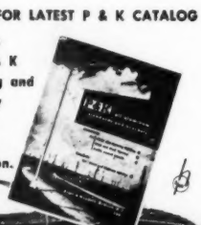

THE NEW JERSEY TURNPIKE

looking toward Laurel Hill and the Lewandowski Bridge crossing the Hackensack River. The P & K All-Aluminum Standards have 30 foot mounting heights, with 15 foot All-Aluminum Tapered Elliptical Arms, and Transformer Bases.

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Best Looking Steel Bridge Selected in 25th ISC

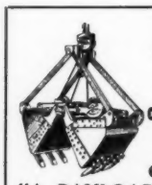
This month, Construction Camera views what have been judged the most beautiful steel bridges opened to traffic in this country in 1952. The winning structures were selected from among entries in the American Institute of Steel Construction's 25th annual Aesthetic Bridge Competition, held at the institute's headquarters, 101 Park Ave., New York City.

The Neches River Bridge in Beaumont, Texas, the Morris Ferry Bridge in Franklin County, Tenn., and the S. E. Fourth Ave. Bridge over the Miami Canal in Miami, Fla., won first prizes in the Class II, III, and IV divisions respectively. Honorable mention went to three bridges in New Jersey, New York, and Pennsylvania. There was no award presented for entries in Class I, which includes bridges with spans of 400 feet or more.

Winning Bridges

The top award in Class II was given the Neches River Bridge for its "clean design" and "serene and graceful lines". The structure is owned by the state of Texas and was designed by the state's highway department. Bethlehem Steel Co. was the fabricator. Class II is for bridges costing more than $500,000, with spans measuring less than 400 feet.

In the division for bridges costing less than $500,000 and having



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In Class IV, that for movable bridges, the **S. E. Fourth Ave. Bridge** in Miami, Fla., won first prize. Its selection was based on its representing "a direct approach to a difficult problem—crossing a stream at an acute angle with a movable span."

Honorable mention went to three bridges, one of which, the **Pedestrian Overpass** over Memorial Shoreway in Cleveland, Ohio, is shown here. Its construction, "in keeping with its use for light pedestrian traffic," contributed to its selection. **Pickens Bridge** in Tennessee and the **Delaware Bridge** between Trenton, N. J., and Morrisville, Pa., also won honorable mention.

Steel Bridges in U. S. 25th ISC Competition

spans under 400 feet in length, the award went to the Morris Ferry Bridge in Franklin County, Tenn. Designed by the Tullahoma District, Corps of Engineers, and fabricated by the Nashville Bridge Co., the span is owned by the county. Its selection was based on its "coherent and restful design".

The S. E. Fourth Ave. Bridge in Miami, crossing the Miami Canal at an acute angle, was chosen for the highest award in the division set up for movable bridges. The Board of County Commissioners, Dade County, Fla., owns the span which was designed by Rader Knappen Tippets Engineering Co., Miami, Fla. Hardesty & Hanover, New York City, served as consultant, and Nashville Bridge Co. handled the fabrication.

Honorable Mention

Two bridges in Class III and one in Class II won honorable mention. The sole honor in Class II category was won by the Delaware River Bridge which connects Trenton, N. J., and Morrisville, Pa. The bridge was described as having "logical, simple, and direct detail". Its "stone piers harmonize with the steel, giving the impression of a beautiful piece of sculpture". The Delaware River Joint Toll Bridge Commission is the owner. J. E.

(Concluded on next page)

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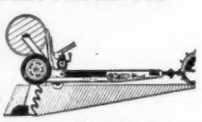

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These pumps are powered by Ingersoll-Rand "Multi-Vane" air motors which have an unequaled reputation for reliability. Put these dependable sump pumps to work for you earning extra profits. They will pump as much as 250 gallons per minute and will handle heads up to 200 feet.

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Size 25 Sump Pump.

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The I-R air operated sump pump is available in Sizes 25 or 35. Both types are lightweight for easy carrying by one man. They use dirt-and-liquid-protected bearings for the impeller and motor rotor. All parts are made of bronze, stainless steel, or rust-proofed steel. The Size 25 can also be supplied with an all-bronze exterior when used in corrosive or inflammable liquids.

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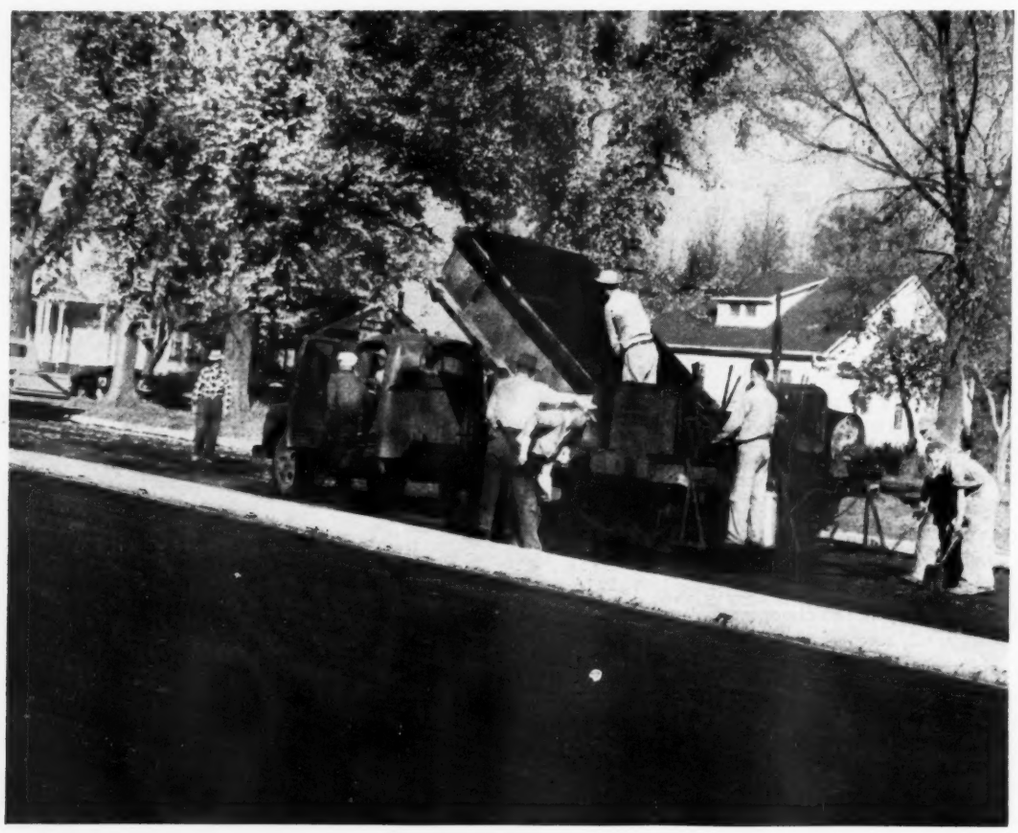
Bridge Preassembly—The truss portion of a 5,200-ton bridge is assembled in the Midland Plant of Allied Structural Steel Co. in Indiana. After all members are perfectly aligned, the section is taken apart and shipped to the erection site in Akron, Ohio.

Thruway Construction—A 6-inch Marlow pump, pulled by an International U-6 power unit, works 24 hours a day to keep a bridge footing dry on part of the New York State Thruway project. The pump lifts spring-fed water approximately 10 feet.



Six Steel Bridges Selected by AISC

(*Continued from preceding page*)

Greiner Co. designed the bridge, and American Bridge Division, U. S. Steel Corp., fabricated it.

Pickens Bridge between Washington and Sullivan counties, Tenn., and Pedestrian Overpass, East Memorial Shoreway, Cleveland, Ohio, shared honorable mention in Class III. The latter bridge's light construction, "in keeping with its use for pedestrian traffic", contributed to its honorable mention. It is owned by the Ohio Department of Highways and was fabricated by The Mount Vernon Bridge Co.

Pickens Bridge was chosen because of the "delicacy of its design, which fits into the landscape". Fabricated by the American Bridge Division of the U. S. Steel Corp., the bridge was designed by the Tennessee Valley Authority and is owned by Washington and Sullivan counties.

A stainless steel plaque will be affixed to each of the three prize-winning bridges while those receiving honorable mention will be given certificates. The entries were judged by Clair W. Ditchy, president of the American Institute of Architects; Dr. Daniel V. Terrell, dean of the College of Engineering, University of Kentucky; Gordon Washburn, director of the Department of Fine Arts, Carnegie Institute; and architects Harris Armstrong and J. Woolson Brooks.

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You add further to these savings by using Standard Oil asphalt. With five asphalt-producing refineries located throughout the Midwest, Standard makes the haul to your site a short one. Prompt, reliable shipments eliminate work delays. Freight costs are at a minimum. A Standard Asphalt Representative will be glad to work with you on your job needs. For his services, write: Standard Oil Company (Ind.), 910 S. Michigan Avenue, Chicago 80, Illinois.

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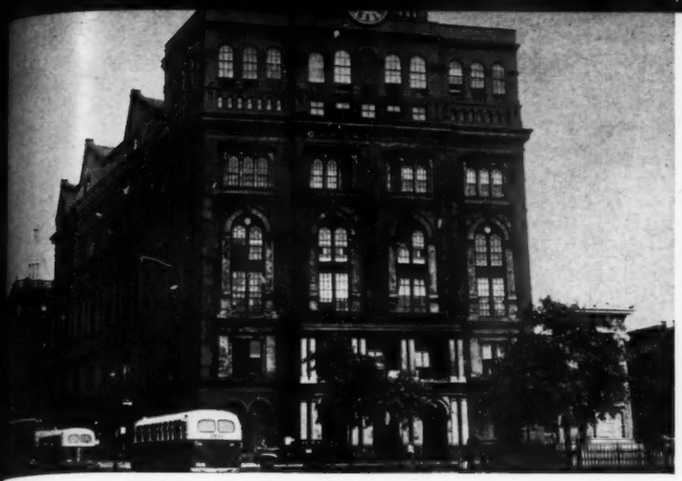

Anniversary—Celebrating its centennial this year is The Cooper Union, New York, N. Y., the oldest building in the U. S. to use rolled structural beams. The structure represents the pioneering effort of U. S. iron and steel construction.

Steel erection—Work goes forward on a new building for Cummins Engine Co., Inc., Columbus, Ind., which will house an air conditioned and dirt and dustproof diesel conveyor line. A Lorain Moto-Crane places steel members.

Tougher Competition Forecast by Survey

Abundant work but intensifying competition and steady pressure for higher wages are what lie ahead for the construction industry, according to a nationwide telegraphic survey of business conditions for the next six months. The survey was conducted among the 122 chapters and branches of the Associated General Contractors in the U. S. and Alaska, and the association's 84 elected national directors. The results were presented at the mid-year board meeting in Chicago in September.

The poll indicates the capacity of the industry has increased to such an extent that, although it is now enjoying the largest annual volume of work in its history, a weeding-out process of contractors unable to adapt themselves to the severe competition is expected.

Materials and construction equipment, the survey discloses, are and will continue to be available and fairly well-stabilized in price, with the exception of fabricated steel and cement which are in short supply in some areas. While an AGC survey last March reported the roughest competition in the industry since 1940, the present poll elicited the almost unanimous opinion that it had gotten even more severe and would continue to intensify.

On the basis of these responses, the survey concludes that the industry will easily attain the more than $34,000,000,000 volume in new

(*Continued on next page*)

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"Ford's new *Driverized* Cab is the best break we truck drivers ever had!" says Mr. Pelino Fewello, driver for the U.P.K. Construction Co., of Arcadia, California. "Now driving's less work and Ford's easy handling takes the grunt out of backing and filling.

"Pulling a train of bottom dumps carrying an average payload of 30 tons, I really need a truck that can take a beating and keep on going! My new F-900 BIG JOB with 155-h.p. *Cargo King* V-8 engine has just the 'get up and go' I need. Its terrific lugging power makes light work of heavy jobs.

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What about you? Could the time-saving, cost-cutting features of a dependable Ford Truck help you? For complete information write: Ford Division, Ford Motor Co., Dept. T-10, Box 658, Dearborn, Michigan—or call your Ford Dealer *today!*

FORD *ECONOMY* **TRUCKS**

SAVE TIME • SAVE MONEY • LAST LONGER

Power plant—Shown here in the final stage of construction is Italy's new power plant built in Palermo, Sicily, with the aid of Marshall Plan funds. Kuljian Corp., Philadelphia, Pa., designer, was presented the ECA citation award for the project.

Subway construction—Earth is moved in a Philadelphia subway tube now under construction. Buckley & Co., Philadelphia, Pa., contractor on the job, uses a Caterpillar diesel D6 tractor, equipped with a No. 6A bulldozer for the job.

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Within just 40 minutes you can remove a cylinder assembly — replace it with a complete new one — and have your P&H Diesel back in service.

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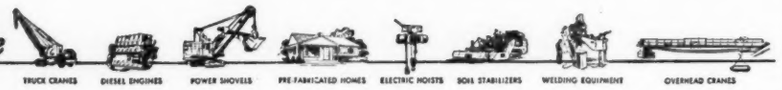

Tougher Competition Forecast by Survey

(*Continued from preceding page*)

construction predicted earlier this year. New construction for the first half of 1953 totaled $16,000,000,000, almost eight per cent above the figure for the same period in 1952. The predicted total for the entire year is six per cent greater than that for the record year of 1952—an increase in volume of $2,000,000,000.

Indications point to an increase in building, highway, and heavy construction during the next six months. The greatest jump is forecast for highway construction and the smallest, for building work. Industrial and residential construction is expected to decline, but there will be gains in commercial and school construction. The situation in public works is apparently going to remain fluid with the slack in Federal construction being taken up somewhat by increases in state, municipal, and county contracts.

Pressure for increased wage rates was expected by 60 per cent of those polled. Thirty-eight per cent, most of whom have recently signed contracts with labor, expect no new wage demands. Only two per cent expect wages to decline.

Contractors volunteered several factors contributing to the stiffening competition. An increase in the number and size of firms in the industry, plus an increase in mechanical and over-all efficiency due to new equipment and methods was one major reason. Small contractors have been entering the market of larger projects; more firms are bidding on more jobs and crossing state lines to get them.

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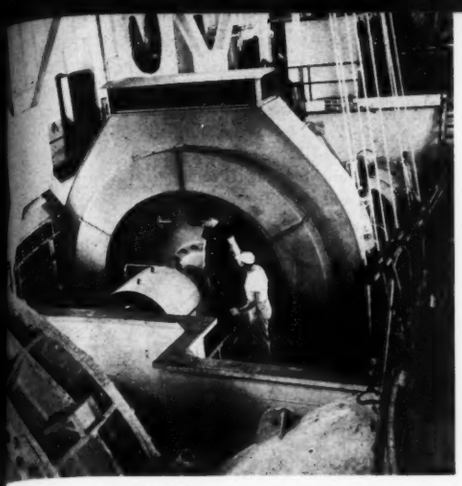
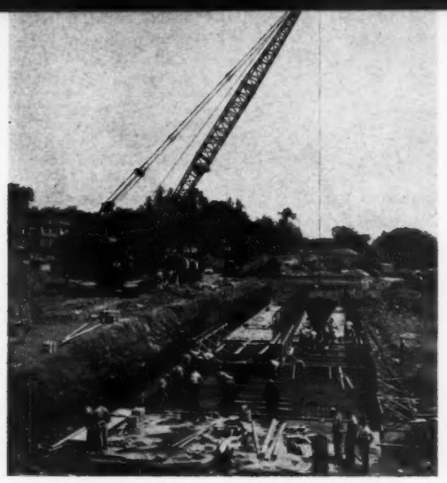


Power Supply—The largest induction motor used on a dredge (it's a General Electric) drives the Hydro-Quebec, now clearing Beauharnois Canal in Canada.



Parkway Culvert—Contractors use a Koehring crane and Insley lay-down bucket to place concrete for a double-box culvert on New Jersey's Garden State Parkway.

Cleanup—Chunks of concrete are removed from a Cleveland street after an explosion demolished concrete paving. A Lorain Moto-Crane loads debris on a truck.

New, inexperienced bidders are forcing bids down in an attempt to get started. Contractors entering new construction categories are also bidding low. Many do not have accurate cost data for their new fields. Low bids have been coming from large contractors who are attempting to keep their crews together and their equipment operating.

Some contractors are uncertain about the future and concerned about next year's volume. They believe the country is in for a period of readjustment and are taking everything they can get now in an effort to build a backlog. The influx of government contractors, due to the slowing down of Federal construction and the tapering off of defense work, has further tightened the competition. THE END

Mexican Engineers

The Kansas Highway Department has made plans for the employment of six English-speaking Mexican graduate highway engineers to help alleviate the shortage of qualified civil engineers in that state. One British engineer has also been accepted.

The foreign road builders will remain on the job between one and three years if they satisfactorily complete a three-month trial period. In return for easing the shortage of qualified civil engineers in Kansas, the new men will be able to familiarize themselves with American highway construction methods. This knowledge and experience will be invaluable to them when they return to their native lands.

The first drive-in filling station is believed to be that opened in Pittsburgh, Pa., in December, 1913.

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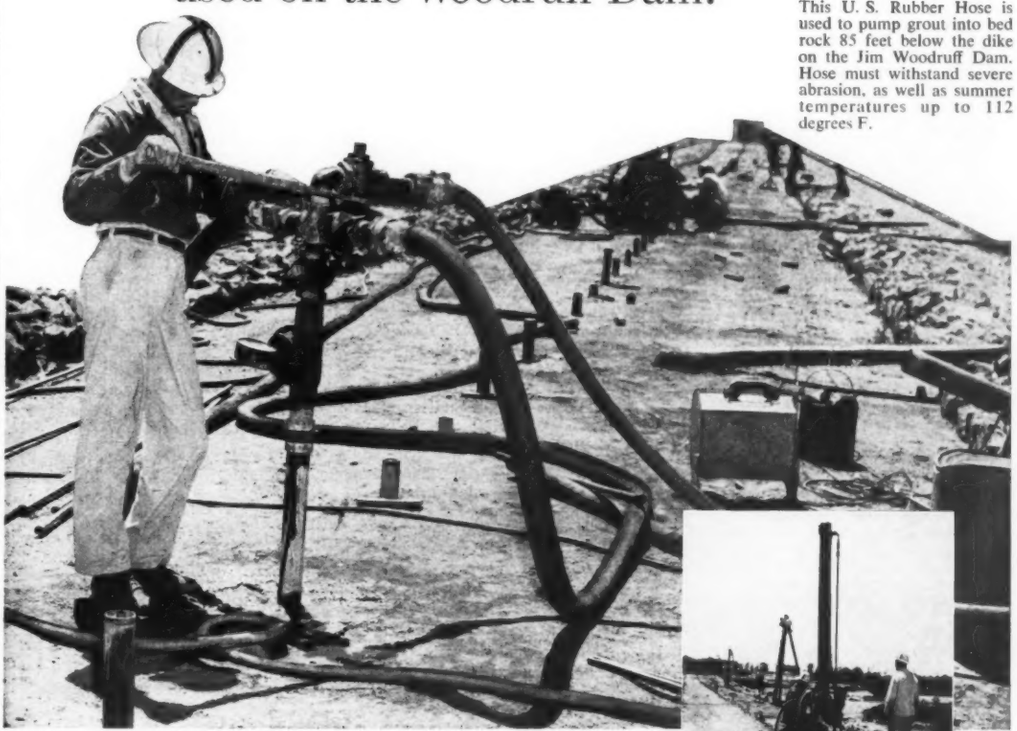
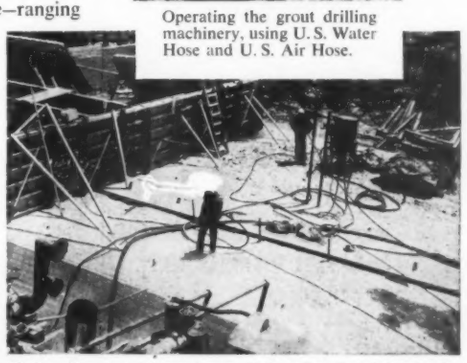


This U. S. Rubber Hose is used to pump grout into bed rock 85 feet below the dike on the Jim Woodruff Dam. Hose must withstand severe abrasion, as well as summer temperatures up to 112 degrees F.

Operating the grout drilling machinery, using U. S. Water Hose and U. S. Air Hose.

Yes, in building the great Jim Woodruff Dam in Florida, well over 8 miles of United States Rubber Company hose is being used. Hose for tools and pumps, water hose, grout hose, hydro-blast and hydro-silica hose—ranging from one-half inch to eight inches I.D. The hose used for hydro-blast is used at 2000 lbs. pressure. The contractors' Purchasing Department selected "U. S." hose because of its ready availability and because, in their own words, they felt it was "top-line hose". They did not regret their choice.

"U. S." makes hose for every kind of industrial need. keeps stocks at strategically located centers for fast supply. This service, plus the fact "U. S." insists on making only a *quality* product, are the reasons why you should see "U. S." for hose. Call any of our 25 District Sales Offices, each staffed with engineers, or write to address below.



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Wide Color Range In Masonry Paints

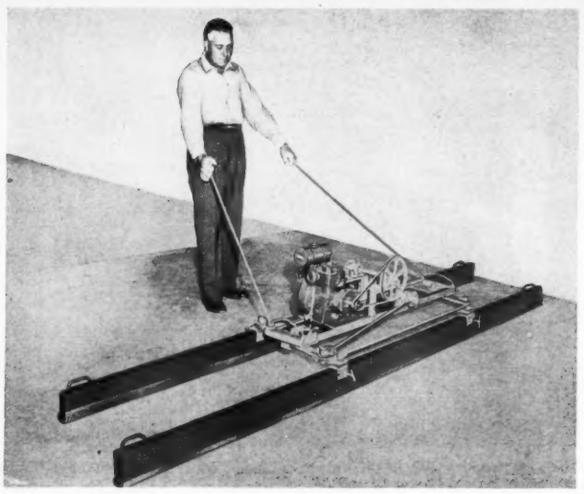
■ A new masonry paint that will cover stucco, brick, concrete, and construction block, and is available in a wide variety of colors has been announced by the Martin-Senour Co., 2520 S. Quarry St., Chicago 8, Ill.

Colorsol comes in 12 packaged colors with seven colorants in tubes. The manufacturer states that the packaged colors with the toners will produce 144 colors.

The alkali-resistant paint is said to retain its color under extreme weather conditions and to resist mildew and fungus.

Color samples are available in a color-chip fortfolio.

For further information write to the company, or use the Request Card at page 18. Circle No. 300.



The concrete "Smoothie" is shown leveling concrete slabs. A 2-hp gear-reduction Lawson motor, working through an eccentric, activates the runners on a back-and-forth motion. The operator pulls the whole device across the slab. The runners, which are detachable, can be adapted to any width. For further information write to the Columbus Steel Fabricating Co., Columbus, Nebr., or use the Request Card at page 18. Circle No. 312.

Trailer-Load Support

■ A new adjustable load-bearing chain support that prevents load spreading in open and closed trailers is announced by the Canton Mfg. Co., 2408 13th St. N. E., Canton 7, Ohio. The device has forged eye bolts that are secured to the trailer sides. The chain slack is taken up at the middle and locked by a 12-inch lever-type load binder.

The kit is also available with a 1-ton screw-type ratchet binder.

For further information write to the company, or use the Request Card at page 18. Circle No. 218.

Concrete-Batching Plants

■ Prices of equipment for concrete-batching plants are set forth in literature from the Lippert Bin Co., 212 E. First St., London, Ohio. The booklet describes separate plant components and complete plants.

Single and dual-bin bulk-cement plants for truck-mixer charging, ground-storage bins for increasing storage capacity of existing plants, and 2, 3, and 4-compartment aggregate bins are among units priced.

The company also makes complete combination-aggregate-and-cement plants with two or three aggregate compartments and one sealed weathertight cement compartment. Ground-storage cement bins up to 555 barrels are available for the portable plants. Weighbatchers are of the beam-scale type, with dial scales provided at extra cost.

Specifications and prices are also listed for bulk-cement equipment for the concrete-product manufacturer. Chain and bucket enclosed-type elevators for cement or aggregate are available as separate units.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 242.

New Barber-Greene Plant

The Barber-Greene Co., Aurora, Ill., has opened a new factory and office near Toronto, Ont., Canada. The new plant is operated by Barber-Greene Canada, Ltd., a subsidiary of the parent company. At present it is engaged in the manufacture of belt conveyors. Expansion into other of the company's lines—ditch diggers, bucket loaders, portable conveyors, asphalt mixing and paving equipment—is contemplated.

Existing facilities occupy 30,000 square feet and are situated on a 16-acre plant site, allowing room for expansion.

Officers of the new firm include W. B. Greene, chairman of the board; W. B. Holder, president and treasurer; H. A. Barber, vice president; A. S. Greene, secretary and sales manager; and Urban Hipp, assistant treasurer.

Tuffy®

Helps Operators Make Better Time & Yardage

"My Operators Like Tuffy SCRAPER ROPE Better Than Any"

Says Owner of a Nebraska Construction Company

Wheel scrapers need wire rope that stands up under strains and stresses that hoist or other standard ropes can't take . . . and Tuffy Scraper Ropes do the job! Each strand is pre-shaped, which relieves it of internal stresses. This leaves the full strength of every strand free to carry its share of the load! Tuffy is flexible enough for easy handling, easy winding . . . and so designed to resist drum crushing caused by rope crossovers. Just ask for:

Tuffy Scraper Rope
_____ Reels _____ Feet
How Many Length
_____ inch in diameter.

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Specialists in Wire Rope and Braided Wire Fabric
2260 Manchester Ave., Kansas City 3, Mo.
Please send me my FREE illustrated folder on Tuffy Scraper Rope.
Firm Name _____
By _____ Title _____
Address _____
City _____ Zone ___ State _____

New "ECO-TEMP" Portable Heating Unit

Uses L-P Gas . . . Has Automatic Firing

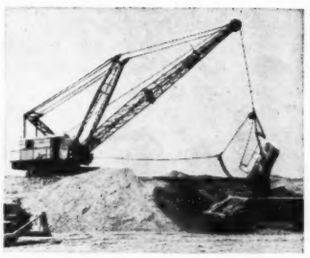
Instant, safe, clean heat—*up to 500,000 BTU's*—is provided by the new "ECO-TEMP" LP Gas Portable Heating Unit with automatic firing. Gas tanks store fuel on the job, with hose connection to heater. Just plug in and turn the valve. The unit goes instantly into operation, with quick rise to temperature and wide-coverage heat that has no smoke or odor. Can be furnished with durable flame-proof vinyl coated canvas heat duct, for spot heating.

Available in three regular sizes—140,000 BTU's, 250,000 BTU's and 500,000 BTU's—for all ordinary heating-drying-thawing operations; and in two super-sizes—650,000 BTU's and 950,000 BTU's—for exceptionally heavy duty, including crop drying. Built to provide superior strength, durability and safety, assuring long, reliable service with minimum maintenance. *Write for complete information and prices.*

ARTHUR C. BAUMANN, *Manufacturer*
7017 Grays Avenue, Philadelphia 42, Penna.

Tuffy®

Easy To Handle But Hard To Wear Out!



"Tuffy Gives Almost Twice The Service That (Another Dragline) Gives"

Says A Texas Construction Company Operator
(Name on Request)

Tuffy Draglines are made of wires of the finest steel, woven in a special dragline design that lets Tuffy take sharper bends, angle pulls and rapid line speeds. In many cases, the built-in extra toughness has helped cut dragline costs . . . helped move more material for longer periods of time. You'll find Tuffy Draglines give you the extra flexibility you want, the extra abrasive resistance you need! See for yourself what Tuffy can do for you. All you need to order is length, diameter and "Tuffy!"

Send For FREE Folder

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Specialists in Wire Rope and Braided Wire Fabric
2260 Manchester Ave., Kansas City 3, Mo.
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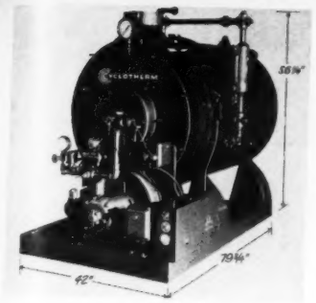


The 50-hp Model C1725 Cyclotherm boiler

Compact Steam-Boiler

■ A compact 50-hp fire-tube steam boiler is announced by the Cyclotherm Division, United States Radiator Corp., Oswego, N. Y. According to the manufacturer, the unit requires less than half the floor space and about two feet less headroom than other steam generators of equal boiler horsepower. The Model C1725 Cyclotherm boiler takes up an area of 20 square feet and is 4 feet 8¼ inches high.

Since the unit requires no cement foundation or stack, it can be mounted wherever water, fuel, and electricity are available. A simple flue vent is all that is necessary to operate at about 80 per cent efficiency.

For further information write to the company, or use the Request Card at page 18. Circle No. 282.

Line of Electric Shovels

■ Electrically powered shovels with capacities up to 10 cubic yards are illustrated in literature from the Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis. The booklet discusses and illustrates the major components of the shovels.

The electrical equipment used on the shovels is built by Harnischfeger for the specific service it performs. The power-drive for the shovels is of an electro-magnetic type coupling. Recent advancements in specialized electrical equipment include a crowd motor, mounted integral and lengthwise to the boom, air filtered electrical equipment, and the independent propel motor. Master control panels provide a stepless control for regulating the power for the individual motions.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 258.

Mobile Crushing Plant With Screening Unit

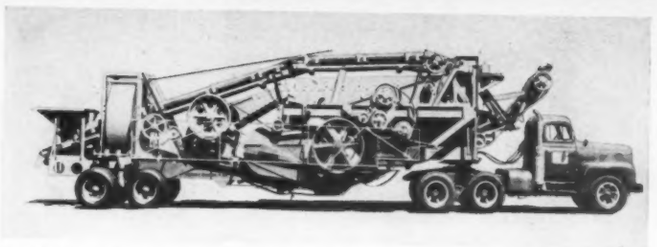
■ A new portable crushing and screening plant is announced by the Diamond Iron Works, Inc., 1748 N. Second St., Minneapolis 11, Minn. The mobile All American 77 can be towed as a trailer or as a separate unit.

The plant has a hydraulic mechanism for raising or lowering the 4 x 12-foot vibrating screen to and from travel position. A hand-operated control, mounted on the operator's platform, activates the hydraulic mechanism.

A 36 x 22-inch Star Gear roll-crusher crushes 2¼-inch material to ¾-inch aggregate. This relieves the 10 x 36-inch jaw-crusher of preparing the material to 1¾ inches for crushing in a smaller set of rolls. According to the manufacturer, the plant is capable of producing 350 tons of ¾-inch-minus aggregates per hour.

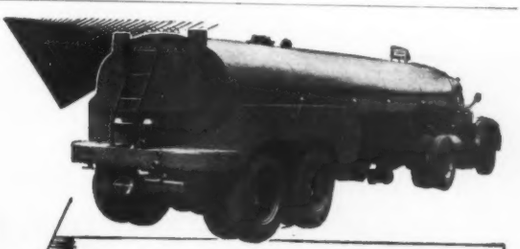
The entire plant is mounted on a pneumatic-tired gooseneck truck provided with a fifth-wheel plate and pin on the front and two axles and an equalizer on the rear.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 174.



The Model 77 Diamond plant moves material in a straight line eliminating bottlenecks, by-passing operations, and double scalping.

Supply Tanks FOR HAULING HOT OR COLD BITUMINOUS MATERIALS



Semi-Trailer models are made by the famous Littleford Frameless Construction — no trailer frame is needed.

The Littleford Supply Tank transfers its Bituminous Material to the Bituminous Distributor for fast economical spraying.

To keep the Spraying Units on the job the Littleford Supply Tanks hauls the Bituminous materials from the source of supply without interruption. These Supply Tanks are the backbone of all road construction and maintenance jobs. Made with or without heating units or transfer pumps, these units speed up the work, are economical to operate and save labor costs. Made in semi-trailer or truck mounted models in sizes ranging from 2000 to 5000 gal. Semi-Trailers, made without the use of a trailer frame, are known as the "Littleford Frameless Constructed Supply Tank".

Make your next road job a low cost modern undertaking, use modern methods and modern equipment, Littleford Supply Tanks.

BLACK TOP ROAD MAINTENANCE EQUIPMENT LB SINCE - 1900 LITTLEFORD

LITTLEFORD BROS., INC.
485 E. Pearl St., Cincinnati 2, Ohio

CUT BRUSHCUTTING COSTS UP TO 83%!

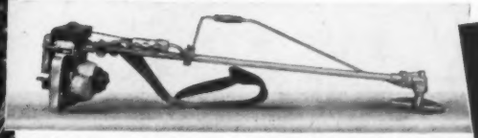
POWER-DRIVEN BRUSHMASTER®

amazing, one-man-operated brushcutting machine is

☆SAFE! ☆EFFICIENT! ☆ECONOMICAL! ☆FAST!

colorful FREE BOOKLET SHOWS HOW

the "machine magic" of BRUSHMASTER can effect important brush clearance savings for your company. SEND TODAY!



It's one man . . . instead of six . . . when Brushmaster takes the field! Count up the savings! Quickly, easily the circular saw blade cuts through matted grass, vines, briars, . . . even saplings to 4" in diameter! SAFE . . . operator cannot come in contact with blade! MOBILE . . . operates overhead, close to ground, right to left and back again! Vibration-free, clutch controlled, positive drive.

BRUSHMASTER SAW, INC.
842 EMERALD ST., KEENE, N. H.

Subsidiary of Harrington & Richardson, Inc., established 1871. Manufactured and sold in Canada by H&R Arms Co., Ltd. Montreal, Canada

SASGEN
New Electric-Powered CHAMPION DERRICK

Boom only can be supplied for use with old-style Mast and bottom

Single line cap. 300# @ 100 feet per minute.

Double line cap. 600# @ 50 feet per minute

The most complete line of contractors' derricks, hoists, and winches. Write for catalog.

The Sasgen line is handled by leading equipment distributors everywhere.

SASGEN DERRICK COMPANY
3131 W. Grand Avenue, Chicago 22, Illinois

Shell Laid as Base For Blacktop Road

One of Jahncke Service's two unloading barges—a Northwest crane with an 80-foot boom and a 2-yard Blaw-Knox clamshell bucket—feeds shell into hopper bin under which trucks are loading. *C. & E. Photos*

In 1940 when the Louisiana Department of Highways built U. S. 90 from the Huey P. Long Bridge westward across the Mississippi River north of New Orleans, suitable material for road construction was scarce. The area was a swamp, and the roadway embankments were constructed of gumbo soil either thrown up by a dragline or pumped in as hydraulic fill. No select material was available for a base course on which to lay the 9-inch-thick x 21½-foot concrete pavement. Consequently, with the heavy traffic using this highway, the concrete slabs began to crack and deteriorate.

Rather than just rebuild the existing road, the highway department decided to turn this section of U. S. 90 into a four-lane divided highway to cope with the increasing traffic burden. A contract was awarded to the Texas Bitulithic Co. of New Orleans, La., to reconstruct 14.2 miles of this road eastward from Boutte, La., to the bridge, for $1,956,762. The new half of the divided highway is on the south side and carries east-bound traffic. The improved existing road on the north side carries west-bound traffic. The opposing lanes, each with a 21½-foot pavement, are separated by a 6-foot raised, grassed median, which is flanked on each side by a concrete curb.

The pavements have tangent crowns, dropping off to the outside shoulder at the rate of ⅛ inch per foot. Outside shoulders are 7 feet wide, and the shallow fills have 3 to 1 slopes. The entire road is built on a slight embankment.

Traffic Maintained

Traffic was maintained at all times

Where can I get down to earth dope on strength and thermal properties of lightweight concrete?

Ask DEWEY and ALMY for DAREX AEA Bulletin No. 9

What type of lightweight concrete should be used to meet strength and thermal specifications? For authoritative answers to this and many other questions concerning lightweight concrete, write for your *free* copy of DAREX AEA Bulletin No. 9.

This fact-filled bulletin is one of the latest additions to an extensive technical library built up through years of "Shirt-sleeves" research in Dewey and Almy's cement and concrete laboratory — one of the best-equipped in the country.

Our engineers will be glad to answer any question you may have about our air entraining agents or any other product of Dewey and Almy research.

DAREX AEA • World's most widely used brand of air entraining agent. Concrete made with DAREX AEA places easier, finishes faster and better, has finer surface texture, is many times more durable when exposed to freezing and thawing.

AIRALON • A ready-to-use air entraining agent and plasticizer that contains all the ingredients necessary to make a superior masonry cement.

DARASEAL • Creates a "membrane" film which keeps water in newly poured concrete for better, more complete curing.

GRINDING AIDS • Catalyzing grinding aids for cement mills that increase grinding rates 15 to 50%, depending upon the type of cement.

DARACONE • Long-lived silicone water repellent for above grade exterior masonry walls. Effectively combats efflorescence and leaks without affecting the appearance or "breathing" qualities of the masonry. Easy to apply.

CONSTRUCTION SPECIALTIES DIVISION

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THE "Quinn Standard" FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 40 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that Quinn pipe forms and Quinn mixing formulas combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from 10" up to 120" and larger—tongue and groove or bell end pipe at lowest cost.

WRITE TODAY. Complete information, prices, and estimates sent on request.

Also manufacturers of
QUINN CONCRETE PIPE MACHINES

QUINN WIRE & IRON WORKS 1645 - 12th St. Boone, Iowa

A Lorain crane with a 35-foot boom helps set up the Warren Bros. asphalt plant on a railroad siding a half mile from the job.

Reef shell is end-dumped to form a windrow over a layer of clamshell down the center line of the old road. The new half is at the right of the median strip.

throughout the construction. There are no detours available across this wide expanse of swamp. The new, or south half of the road was graded, and the median strip was built with its concrete curb. Then a shell base course, 21 inches thick, was laid across the shoulders to the slope line on this new strip. Once the shell course was installed, traffic was shifted from the existing road to the new base.

A new shoulder of shell was first built out along the north side of the old road so that adequate drainage could be maintained during the rebuilding operation. Next, the concrete in the original pavement was broken up even more with a 1,200-pound drop-hammer. This was done to force the rubble into the grade and seat the pieces firmly against any further settlement. The broken slabs were given a tack coat of RC-2 asphalt, applied at the rate of 0.1 gallon per square yard. The old concrete and the rest of the north roadway was then covered with a layer of shells to bring it to grade. This layer varied in thickness according to the amount of settlement involved, but the maximum depth of the shell was 18 inches.

Each lane of base was primed with MC-2 asphalt, applied at the rate of 0.25 gallon per square yard. This was followed by the paving which consisted of bituminous concrete plant-mix, a 2½-inch binder topped by a 1½-inch wearing course. While one-half of the road was being paved, traffic was carried on the other half.

Shell Base

Shell for the base course, totaling about 300,000 cubic yards, was supplied by Jahncke Service of New Orleans from deposits in Lake Pontchartrain. Two types of shells were used—clamshells and dead reef, or oyster shells. After being dredged from the lake, the shell was loaded onto barges capable of holding from 500 to 700 cubic yards of material. A tug towed the barges, three at a time, through the Industrial Canal linking Lake Pontchartrain with the Mississippi River at New Orleans. The tug and barges proceeded up the river to a point on the right bank about three miles above the Huey P. Long Bridge. The 55-mile trip took about ten hours if there were no delays at the lock.

Jahncke furnished a couple of unloading barges to moor along the bank on the batture side of the river levee. There, barges were equipped with long-boom cranes (80 feet) and 2-yard clamshell buckets for loading the shell from the supply

(Concluded on next page)

(Advertisement)

Shovel-Crane Performance Depends a Lot on the Crawler

The crawler on a shovel, crane, dragline, clamshell, or hoe contributes much more to the operation of the machine than just transportation. It is important in many ways to over-all performance.

In the first place, the actual size of the crawler should be related to the type of job being performed. For example, a shovel that operates on firm footing with limited travel, such as in a quarry, can function properly with medium crawler length and tread width. The same shovel moving frequently on soft ground would need wider treads and a longer crawler to give lower ground bearing pressures and consequently better soft-ground flotation.

STANDARD

Dragline and crane work generally require the longest and widest crawlers with the widest treads of all. Working with a long boom at a low angle tends to make the front end of any machine "nose-in", particularly when on soft ground. An extra-long crawler with wide treads to give more "footing" and lower ground pressures can reduce this considerably.

LONG

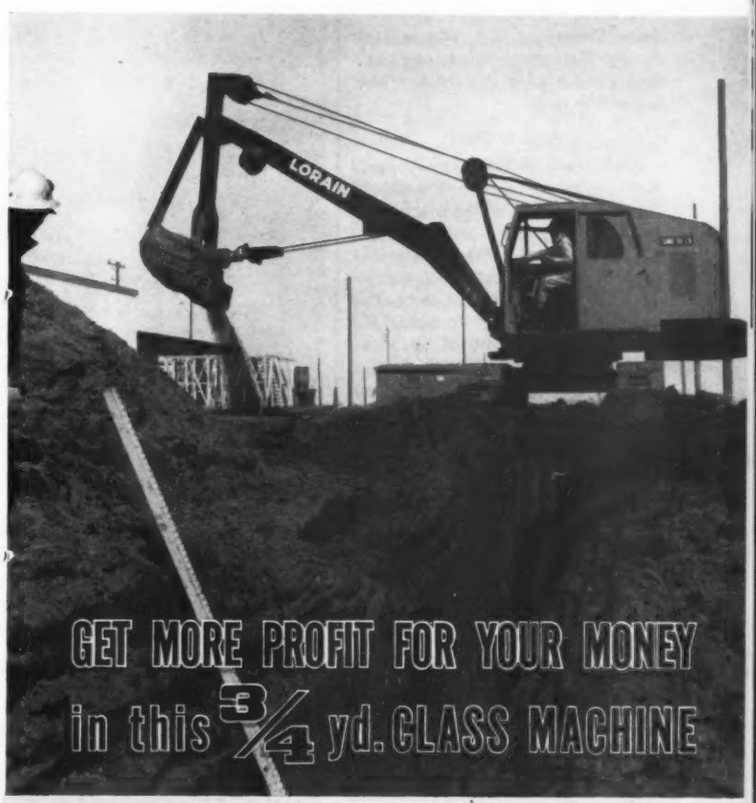
Extra-long, extra-wide crawlers are sometimes used on draglines and more often on lifting cranes to give additional stability and thus, increased lifting capacities.

Crawlers that can travel in either direction and have 4-way tread-travel locks operated by power from the cab are more efficient and safer. These allow the machine to travel forward or "move-up" into the job as necessary; whereas, any rearward thrusts, due to digging action of the machine, work against locked treads to hold the crawler in position. It also eliminates backsliding on uphill work or travel.

LONG-WIDE

Crawlers that can be steered with the turntable in any position of swing save time on the job—and if all crawler controls are operated from the turntable cab, greater and faster maneuverability is obtained.

The crawler can make the difference between profit and loss on a job. Get the right one to fit your needs



The only reason for buying a shovel-crane is to make a profit. This means it has to be reasonable in first cost, fast and easy of operation, long-lasting, easily convertible to fit your needs, easy to maintain and repair and served by a widespread national distributor organization that can give you prompt help in emergencies wherever your jobs may be. Lack of any one of these factors can *decrease* your profits.

Because we know you *must* profit before we do, we *make sure* you get all of these advantages when you buy a ¾ yd. Lorain TL-25 — or any other Lorain — shovel, crane, clamshell, dragline or hoe. Trenching, digging, lifting, any need you have in the ¾ yd. class can be filled with a Lorain TL-25. We can prove the TL-25 to be a profit maker. Get the facts from your nearby Lorain Distributor.

***SEE* WHAT MAKES THE "TL-25" TICK!**

NEW! The first book of its kind in the shovel-crane field — printed in color on transparent acetate so you can "X-ray" the design and construction of each major component. See the "TL-25" "Packaged Component" assembly — how each goes together, step by step. Copies sent at request on your letterhead.

SEND FOR YOUR COPY TODAY!

WIN MORE BIDS WITH THE . . .

THE THEW SHOVEL CO.
Lorain, Ohio

THEW LORAIN TL 25

Shell Laid as Base For Blacktop Road

(*Continued from preceding page*)

barges to a hopper on shore. A fleet of up to 21 trucks backed under the hopper to load, then hauled the shell to the job. The trucks end-dumped the shell in a windrow down the center of the roadway.

The base is made up of about 65 per cent clamshell and 35 per cent dead reef shell. The two types of shell were put down in alternate layers—first a 6-inch layer of clam, then a 3-inch layer of reef shell. Clam shell was always used for the bottom and top layers since it absorbed moisture better than the dead reef shell. Four motor graders—three Caterpillar No. 12's and an Austin-Western—leveled the windrows and bladed the shells evenly across the road.

Asphalt Plant

After each double layer, or 9 inches of shell, was spread, a cleated D7 tractor ran over the material to break up the pieces and lock them firmly together. The shells compacted in an almost 2 to 1 ratio. Thus, to get 12 inches of compacted base, it was necessary to spread the shell to a loose depth of 22 inches. As the courses were leveled off and shaped, both 10-ton steel-wheel and rubber-tire rollers were used in compaction. Water was also added when necessary for compaction and to reduce dust raised by traffic. Each lift was scarified to make a better bond with each new course of shell. For every 100 linear feet of half the divided highway, about 72 yards of shell were required—48 yards of clamshell and 24 yards of dead reef shell.

While the base work was in progress, the contractor set up a Warren Bros. asphalt plant on a siding served by both the Missouri Pacific and the Texas & Pacific railroads. It was located on the land side of the river levee only ½ mile from the job. Jahncke Service supplied sand and gravel for the mix, while Shell Oil Co. furnished the asphalt. Bitumen was delivered in 3,000-gallon feeder trucks from Norco, La., and stored in two tanks holding 11,000 and 6,500 gallons. Another 11,000-gallon tank held the asphalt prime.

Two crawler-cranes were available for erecting the plant and charging the receiving hopper that fed the cold elevator. The plant was equipped with a 70-inch-diameter x 24-foot dryer and a 3,500-pound pugmill. It was powered by a General Motors diesel-electric generator set. After the base was primed with a Littleford distributor, a fleet of hired trucks hauled the plant-mix to the road where it was laid in two courses with Adnun Black Top Pavers. Compaction was achieved with three-wheel and tandem steel-wheel rollers.

Bridge Raising

Also included in the contract were extensions for four existing concrete girder and deck bridges to take care of the widened roadway. The original structures were raised 10 inches to meet the new grade. Each bridge has two spans; three are 38 feet 9 inches long and the other is 28 feet 9 inches long. Bridges were raised one span at a time; the short spans weighed 75 tons while the long spans weighed 100 tons.

In raising the bridges, 12 hydraulic jacks—Simplex, Blackhawk, and Walker—were hooked up in tandem, six at the end of each span, to lift the concrete girders. I-beams were placed over the caps, and concrete risers were poured around them up to the new height. Approach slabs were also laid to provide a smooth transition to the raised bridge deck. Work on each bridge was completed in from eight to ten working days.

Major items on the 14.2-mile divided-highway contract included:

Shell base	300,000 cu. yds
Bituminous concrete, binder course	46,518 tons
wearing course	29,590 tons
Asphalt prime coat	90,800 gals.
Class A concrete	777 cu. yds.
18-inch precast concrete piles	5,355 lin. ft.
Plain concrete curb	145,595 lin. ft.
Common excavation	90,000 cu. yds.
Concrete patching	2,500 sq. yds.

J. G. McWilliams was general superintendent for Texas Bitulithic Co. on the highway contract. For the Louisiana Department of Highways, Bruce Perdue was project engineer. The Department is headed by E. J. James, chief engineer, with R. H. Vaughan, construction engineer. THE END

Data on Oil Gaging Tapes

■ The care and use of oil gaging tapes is described in literature from the Lufkin Rule Co., Saginaw, Mich. The booklet explains how to get the most accurate readings and the longest service from the company's gaging tapes.

The gaging tapes are offered in a chrome-plated line with jet black markings and in dull black with bright steel figures and graduations in slight relief. The tapes come from 25 to 100 feet in length.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 192.

NEW!

EIMCO 105's are new equipment for mining, construction, quarry, tunneling, logging, oil fields, farming or any job requiring a thoroughly tough unit as a prime mover, bulldozer, or loader.

Machines are designed, usually, for a weight limit to sell at a price OR THEY ARE DESIGNED FOR SERVICE. EIMCO machines have always been designed for service — weight and price receive no consideration. The result in this case is a unit designed to give maximum life — (3 to 4 times more than ordinary equipment in the same class) — with minimum maintenance attention. Trouble free service for many years on the job.

Construction is rugged, with each piece designed for maximum loading conditions — using the most modern metallurgical research and best in tooling and equipment. Each part is processed to give it toughness and hardness in the right places.

On the EIMCO 105 you'll find no weak spots designed to produce repair parts sales. No bulk weight spots to provide "cheap beef". Every part is functional — made of steel — fabricated, or alloy steel forgings and castings. The 105 is powered to give maximum effective use of every ounce of energy applied.

See this unit in action — operate it yourself. There is nothing like it anywhere! You'll be amazed at the easy controls, the performance — the simplicity. Write for more details.

The Eimco Corporation, manufacturers of heavy mining, construction and processing equipment and has been serving industry since 1884. With its own complete manufacturing facilities, which include iron and steel foundries, steel fabrication shops, forge and press shops, complete machine and assembly shops, laboratories, research, testing and process development departments. Eimco controls the manufacture of the product from [illegible]

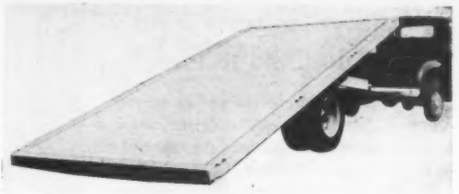
New Bridge Form Achieved

Freedom of form previously available only with concrete has been achieved with steel materials in a bridge spanning the Rio Blanco River near Vera Cruz, Mex. By applying welding techniques, Mexican engineer Camilo Piccone has projected a span with slender arch ribs that is free of cumbersome bracing.

The structure is based on a new design conception by Dr. Thomas C. Kavanagh, chairman of the department of civil engineering at New York University's College of Engineering.

The 250-foot-long, all-welded steel, splayed-arch highway bridge accommodates three lanes of traffic. Its unconventional design extends also to the flooring, where a diagonal gridwork of floor beams has proved far more economical than usual bridge floor systems. Its strength and safety factors are as high as those in conventional constructions.

The Rio Blanco span, part of the Mexican federal highway system, was constructed under the direction of the Papaloapan Commission. Contractors and fabricators were the firm of Estructuras, S. de R. L., of Monterrey, Mex.



The Dorsey Model A15 tilting trailer.

Light Trailer Models Tilt To Take On Load

■ A line of light trailers that tilt to load machinery and equipment for hauling is made by Dorsey Trailers, Elba, Ala. The two models offered have capacities of 15,000 and 20,000 pounds. Platform size is 8 x 14 feet on both units.

Standard equipment on the Dorsey Tilt-To-Load trailers includes platform, rubrail assembly with standard pockets and outside skidrail, lunette eye for attaching to the pintle hook on the towing vehicle, and safety chains. The trailers are mounted on dual-wheel single-axle assemblies.

For further information write to the company, or use the Request Card at page 18. Circle No. 276.

ADER—WITH COST SAVING ADVANTAGES

NEW Eimco Transmission:

Eimco's great new Unidrive achieves supremacy in engineering advancement of tractor power transmissions.

The Unidrive is a compact transmission containing in one unit all of the gearing and clutches for speed changing and full independent reversal of each tracks. Its unique design combines all of the best features of torque converter, constant mesh gearing, hydraulically actuated friction clutches and sealed oil bath, pressure lubrication of all wearing parts.

The oil-cooled, positive engagement clutches never need adjustment. The precision helical gearing is alloy steel, carefully heat-treated and micro-shaved for years of quiet operation.

NEW Controls and Instruments:

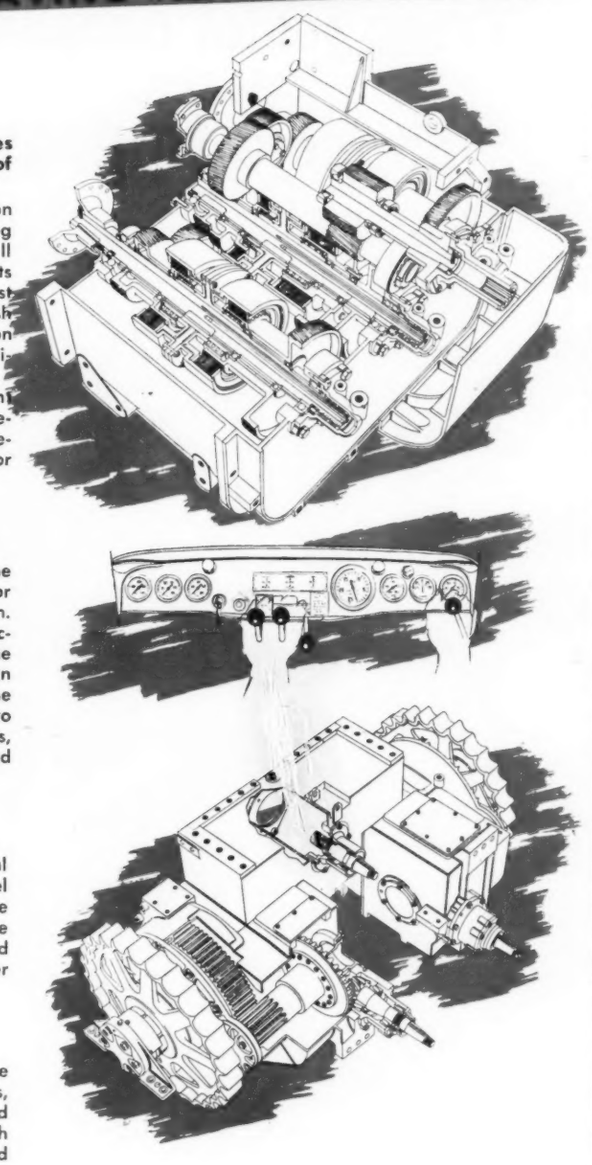
The Eimco 105 may be operated by one hand covering two small levers. Push for forward motion, pull for reverse motion. Each lever controls the track on its respective side, a twist of the wrist starts one track in forward motion and the other in reverse for a spin turn or release one handle and it will automatically return to neutral for a gradual turn. Attachments, such as the Eimco loader can be operated by the other hand.

NEW Final Drive:

Each track is equipped with its own final drive in a cast steel case with a cast steel cover. These final drives do not house clutches or troublesome gadgets. They are sturdy heavy-duty parts carefully machined for silent operation and long service under unusually difficult job conditions.

NEW Many Other Features:

There are many other features in the 105 such as: instant reverse at all speeds, torque converter cushioned drive, air cooled precision disc brakes, all metallic clutch facings, full flow oil filters, force feed lubrication, adjustable digging depth stops, variable height discharge, 1½ to 2½ cubic yard buckets and many others.



EIMCO

THE EIMCO CORPORATION
Salt Lake City, Utah, U.S.A.
Export Office: Eimco Bldg., 52 South St., New York City

Line of Asphalt Plants

■ Literature on portable and stationary asphalt plants is available from the McCarter Iron Works, Inc., Norristown, Pa.

The portable plants, made in 1, 1½, and 2-ton sizes can be carried on trucks and trailers and are erected and dismantled in the field. The manufacturer states that all units are of generous size to eliminate bottlenecks. Electric-motor drives are standard, but gasoline or diesel power is available.

The stationary plants have capacities of 40 to 125 tons per hour. They are equipped with either a hot or a combination hot-and-cold dryer. The literature is illustrated with engineering drawings that identify the operating components of the plants.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 243.

Hard-Surfacing Rod

■ A new hard-surface gas welding rod with high resistance to sand and earth abrasion is announced by the Marquette Mfg. Co., 307 East Hennepin Ave., Minneapolis 13, Minn.

The No. 10 Gas Hard-Rod is recommended for use with sand and gravel equipment and earth-moving machinery. The rod builds up parts subject to severe wear and abrasion but low impact.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 307.

Petroleum Publication

■ The October issue of *Lubrication*, the technical publication on lubricants published by The Texas Co., 135 E. 42nd St., New York 17, N. Y., features an article on low-temperature hydraulic operations. The article gives lubrication information and data for cranes, bulldozers, tractors, snowplows, and lifts. In its conclusion, it emphasizes that to allow hydraulic machinery to operate at its best efficiency, as well as to resist wear and deposit formation, hydraulic systems should be supplied only with high-quality oil of the viscosity grade recommended by the equipment manufacturer.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 287.

Weather-Forecast Data Helps Builders to Plan

■ A new weather-forecasting service enables the contractor to plan his operations around predicted trends in the weather. The service is offered by Western Union, acting as sales agent for the private weather forecasting services of the National Weather Institute of Los Angeles. Subscribers may obtain forecasts for particular geographical areas dealing with specific weather factors affecting their business. The forecasts are made for any part of the United States, large or small, for periods of one to six months in advance. Short range forecasts, seven days in advance of the weather, are telegraphed to clients. Sudden developments of critical or emergency weather conditions are also wired.

The service offers bidding forecasts and long-range operational forecasts. The bidding service is designed to tell the contractor what weather he may expect at a particular site for the limited period covered in his bid. If his bid is successful, the contractor may then get more detailed supplemental reports at least once a month, and he may ask questions of a specific nature whenever a special need arises. Long-range operational forecasts cover extended periods during which a job is in progress and can be oriented to emphasize specific weather factors that may affect particular operations.

For further information write to Western Union Telegraph Co., 60 Hudson St., New York 13, N. Y., or use the Request Card at page 18. Circle No. 283.

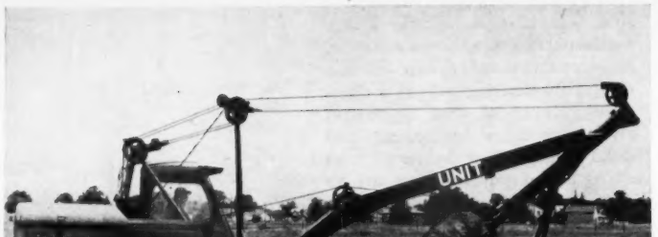
Concrete Vibrators

■ Concrete vibrating equipment is illustrated in new literature from the Viber Co., 726 S. Flower St., Burbank, Calif. Specifications are given for a variety of types and accessories. Three models of pneumatic external vibrators are shown with vibrating speeds from 2,000 to 12,000 rpm. The literature also describes electric, pneumatic, and gasoline-type internal vibrators.

Special-purpose units include vibrators intended for small sections, such as thin partitions, and models equipped with short flexible drives and conveniently arranged handles. An electric internal concrete-paving vibrator is also shown.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 289.

"You didn't say what kind."



A trench-hoe boom with a gooseneck or offset design is now the standard trench-hoe attachment for the Unit Model 1020 excavator. The machine has a ¾-yard capacity. For further information write to the Unit Crane & Shovel Corp., 6411 W. Burnham St., Milwaukee 14, Wis., or use the Request Card at page 18. Circle No. 274.

Diesel-Powered Scraper

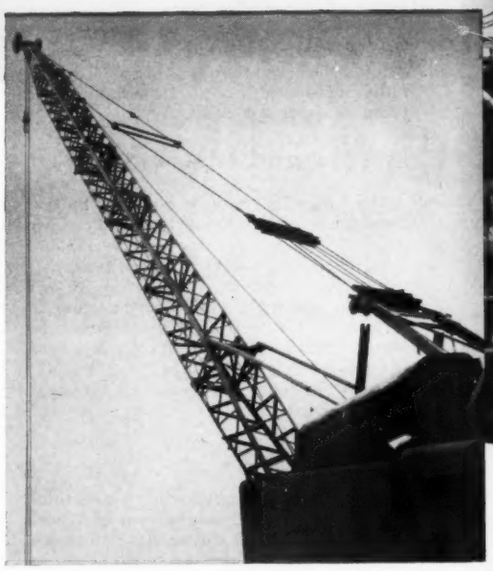
■ A booklet on the Caterpillar DW21 scraper is illustrated with pictures of the unit on a variety of jobs in each of which some feature of the earth-moving machine is stressed. Special attention is given to the unit's 6-cylinder diesel engine, its hydraulic steering, and the specially-mounted push-block set well to the rear of the scraper tires.

An advantage claimed is that the operator can see the scraper blade at all times and knows how much earth he is getting every pass. On an airport construction job illustrated, the complete ejection of material from the scraper is shown.

To obtain this literature write to the Caterpillar Tractor Co., Peoria 8, Ill., or use the Request Card at page 18. Circle No. 228.

Crane rental company increases sa with these Improved Tiger Brand Boo

The Right Wire Rope will do the trick!



THE NEW Tiger Brand Boom Supports on this 25-ton Cranemobile can be inspected visually, because there are no sockets to hide part of the rope. What's more, interwoven ends distribute vibration over a longer part of the rope—keep these improved boom supports in safe operating condition 2 to 3 times longer.

THIS 20-TON MOBILE CRANE, at work on the Forest Hills Overpass in Boston, Mass. is equipped with ⅝" Tiger Brand 18 x 7 Non-Rotating Hoist Rope, ½" Tiger Brand 6 x 19 Boom Falls, and ⅞" Tiger Brand Boom Supports. All of these Tiger Brand products are giving excellent service.

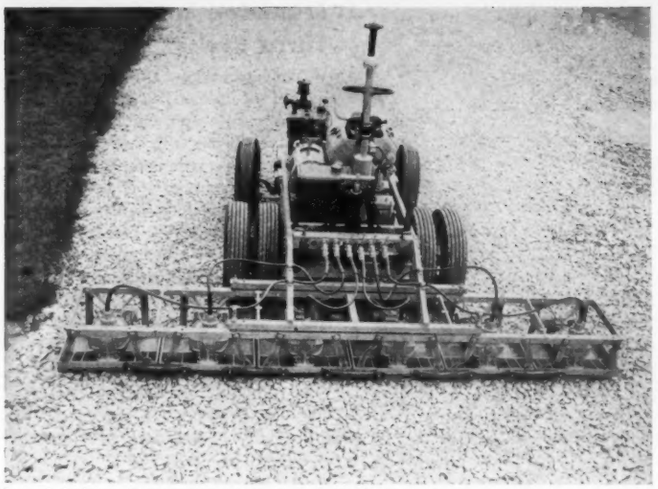
Cranes on Tilt-Up Work

■ A booklet on the application of Lorain cranes to the tilt-up method of precast concrete slab construction is available from the Thew Shovel Co., 28th St. and Fulton Road, Lorain, Ohio.

Many types and sizes of cranes are being used on these jobs, but according to the booklet, the rubber-tired Moto-Cranes have been particularly adaptable to this work because of their ability to lift slabs and roll up quickly into position to set the slabs in place.

The new booklet shows a number of such units at work and contains a section giving detailed job data.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 200.



Several Jackson vibratory compactors are combined in this self-propelled unit. ►

Multiple Compactor Is Self-Propelled

■ A new multiple compactor for macadam base and granular subbase construction is announced by Jackson Vibrators, Inc., Ludington, Mich. The Jackson Vibratory multiple compactor consists of the company's individual compactors assembled and attached to a workhead which is mounted on a maneuverable tractor.

The manufacturer states that the machine will sufficiently compact 12 inches of rock in one pass to support smooth rollers. It will key and compact to final density in four passes. The manufacturer also claims that if enough dry fines are spread on top in one application it requires just two passes for the machine to completely fill the voids from top to bottom of the course.

Working speed of the machine is up to 60 fpm with a reverse travel speed up to 5½ mph. The machine runs on six low-pressure pneumatic tires which permit a short turning radius without displacing rock or fines. Standard width of the unit is 13 feet 3 inches.

The individual compactor units may be removed on the job for work in narrow places. A handle which can be attached to one of these 26-inch units is furnished with the machine.

The entire compactor workhead is removable leaving a mobile Jackson gas-electric power plant for emergency lighting and for running power tools.

For further information write to the company, or use the Request Card at page 18. Circle No. 188.

Two-Lever-Arm Buckets

■ A line of clamshell buckets is shown in literature from the Jos. F. Kiesler Co., 938 W. Huron St., Chicago 22, Ill. The line features two-lever-arm buckets with power on both shells for superior digging force. The clamshells use a simple cable reeving with no reverse or S-bends.

The company's Type N digging and general-purpose buckets are made in ¼ to 5-cubic-yard sizes. These are recommended for digging blue clay, gumbo, hardpan; excavating; and for heavy-duty rehandling. A dredging bucket in ⅜ to 5-cubic-yard sizes is made for extra-heavy-duty digging, dredging, or excavating.

The line also includes standard and wide Type H rehandling buckets with a special shell design that allows the bucket to discharge its load completely when only partially opened. Teeth and counterweights can be attached to the standard Type H bucket for ordinary digging. Sizes are ¼ to 5 cubic yards.

Kiesler buckets can be fitted with a plate riveted to the inside of the regular shell plate at the cutting edge to increase the life of the shell plate. Perforated shells can be furnished. The company also offers buckets with special head beam or equalizer bars with the required spacings for the holding and closing lines where installations require 3 or 4 lines for operation on an overhead traveling crane.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 237.

safety Boom Supports

Last year, Lee Crane Service, Inc., Boston, Mass., added an extra measure of safety to every one of its 14 truck cranes. It removed apparently sound—but potentially dangerous—boom supports equipped with ordinary zinced sockets and installed new Tiger Brand Boom Supports.

Visual inspection now possible

Here are the reasons for this change, as told by Mr. Joseph Veanor, owner of Lee Crane Service: "Easy *visual* inspection is the reason we switched to Tiger Brand Pendants. With the old zinced-socket type, we could never be positive that a pendant was completely safe because the sockets hid part of the rope.

"These Tiger Brand Pendants completely eliminate the use of sockets. As a result, we can see and inspect *every* part of the rope. If any wires are broken, we can replace the pendant before a failure occurs. In that way, we can be sure that every one of our booms is completely safe."

Last 2 to 3 times longer

Tiger Brand Boom Supports last longer than the old-fashioned socket type, because each end of the wire rope is tightly and permanently interwoven. This spreads strain and vibration over a much longer section of the rope, instead of concentrating all the strain right at the socket. As a result they last 2 to 3 times longer than other types.

Easily installed

Lee Crane Service had no trouble converting to these modern Tiger Brand Boom Supports. All fittings are standard size, so no alteration of equipment was required.

Send the coupon for more information on these improved boom supports. Or get in touch with our nearest sales office.

American Steel & Wire
Rockefeller Building
Cleveland 13, Ohio.

Please send my free copy of your descriptive folder on Tiger Brand Wire Rope Boom Support Assemblies.

Name.....

Company.....

Address.....

City.....State.....

AMERICAN STEEL & WIRE DIVISION, UNITED STATES STEEL CORPORATION
GENERAL OFFICES: CLEVELAND, OHIO
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA., SOUTHERN DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U·S·S AMERICAN TIGER BRAND WIRE ROPE

Excellay Preformed

UNITED STATES STEEL

The boom of the new Wagner Model WSL loader turns the bucket 90 degrees to dump.

Front-End Loader Turns Bucket to Dump

■ The latest Wagner front-end loader swings its load 90 degrees to the right or left for dumping. The new-type boom with a lateral swing of 180 degrees makes it unnecessary to maneuver the tractor for dumping. Capable of lifting ½ ton, the Wagner Model WSL Swing Loader can lift and crown loads to a height of 10 feet.

Because of its design, the new loader requires no stabilizers. Wheel weights and the dual rear tractor wheels afford a 150 per cent safety factor against tipping, the manufacturer reports.

The unit uses Wagner's hydraulic system with third-cylinder action. It can be equipped with all of the company's standard attachments and is suitable for gravel, sand, and rock loading, as well as snow removal. The company makes an offset snow bucket for close curb cleaning without extra maneuvering of the tractor.

For further information write to the Wagner Iron Works, 1905 S. First St., Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 236.

Oil-Type Clutch Used On Track-Type Tractor

■ The addition of an oil-type flywheel clutch as standard equipment on the Cat D7 track-type tractor has been announced by the Caterpillar Tractor Co., Peoria 8, Ill. The new clutch was made standard equipment on the D8 and D6 tractors and the No. 6 shovel earlier this year.

In this type of clutch, all the working parts are operated in oil to reduce friction. The manufacturer expects that, under ordinary operating conditions, the overhaul period of this clutch will coincide with the normal overhaul of the engine.

For further information write to the company, or use the Request Card at page 18. Circle No. 187.

The Buda Model HBL drill has a tower extension and power winch that pulls 20 feet of auger at one time.

Deep-Hole Earth Drill

■ A truck-mounted earth auger for deep-hole drilling is made by the Buda Co., 154th St. and Commercial Ave., Harvey, Ill. The Model HBL features hydraulic power that raises the drill tower to operating position quickly. A hydraulically operated retractable base slides the unit backwards for drilling and forward for pulling augers from the hole. This eliminates the need for moving the truck during any part of the drilling and retrieving operation.

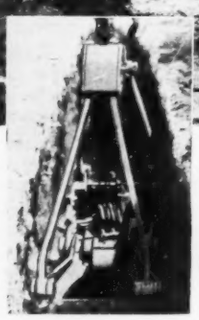
The machine drills 6-inch-diameter holes to a 100-foot maximum depth; 8-inch holes to a depth of 80 feet; and 10 and 12-inch holes to a depth of 50 feet. The unit can be obtained with a tower and spindle of sufficient height for drilling holes up to 42 inches in diameter to a depth of 10 feet.

The drill is self-powered by a Buda gasoline or diesel engine.

For further information write to the company, or use the Request Card at page 18. Circle No. 215.

Top notch efficiency in

DEEP DOWN SPOT DIGGING...



Tangible, valuable features contribute to the exceptional trench excavating of

OWEN BUCKETS

Basic features include: *correctly designed shells* for easy penetration and discharge—*removable counterweights* to help force the shell into material and the block and tackle principle of multiplying closing power.

Others are *low headroom* that makes handling easy—*low center of gravity* that aids in placing the bucket when below the line of vision and *side cutters* which cut clearance for the bucket and aid in maintaining parallel trench walls.

"A mouthful at every bite"

BUCKETS AND GRAPPLES

Write for Catalog

THE OWEN BUCKET CO.

6630 Breakwater Avenue • Cleveland, Ohio

Detroit New York Philadelphia Chicago Rockaway Calif. Fort Lauderdale Fla.

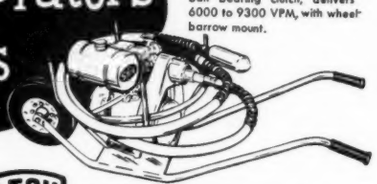
Concrete facts about Concrete Vibrators and Screeds

STOW SCREED

In beam sizes up to 30'. 2 HP air-cooled engine. Mounted on 4 multiplane vibration dampeners. Also available without beam.

Model AGW

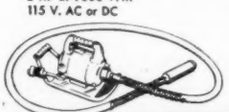
4½ HP 4 cycle air-cooled engine, automatic centrifugal ball bearing clutch, delivers 6000 to 9300 VPM, with wheelbarrow mount.



Model BU

2 HP at 9000 VPM

115 V. AC or DC



See your STOW distributor about STOW vibrators and screeds today. Send for free Bulletin 526.

STOW is the name you want!

The high operating speeds of the new STOW line of Concrete Vibrators make possible the use of heavy duty, light weight flexible shafting and lighter, more efficient vibrator heads—which speed operations, cut costs. And, STOW design provides convenient, practical speed control so *attachments may be used directly on the vibrator shafts.*

STOW SCREEDS—permit placing more than 300 cu. yds. in less than 8 hours; strike off and impact in one operation; leave surfaces true to grade; work up to and around manhole covers and obstructions.

STOW

STOW MANUFACTURING COMPANY—

40 Shear Street Binghamton, New York

Prestressing Units

■ Prestressing units for concrete construction are described in literature from the Intercontinental Equipment Co., Inc., 120 Broadway, New York 5, N. Y. The Freyssinet prestressing units are delivered in 5-foot-diameter coils. The anchorages are detachable, and the length of the prestressing unit can be adjusted in the field. Grouting of the unit is done directly through the anchorage with no special grouting connections required.

The prestressing units are available in five sizes with ultimate strengths ranging from 15,000 to 135,000 pounds. They are available in practically unlimited lengths, thereby avoiding the need for a coupling device.

The booklet covers construction procedure and lists the ultimate strength, size of unit, recommended prestressing force, and other details on prefabricated prestressing units.

To obtain this literature write to the company, or use the Request Card at page 18. Circle No. 191.

Bituminous Plant Feeders

■ A wide variety of cold-feed methods adaptable to all makes of bituminous plants are shown in literature from the Barber-Greene Co., 400 N. Highland Ave., Aurora, Ill. The booklet points out the advantages to be obtained from each of the several types of feed systems.

The company's new series of wheel-mounted 4-bin feeders, which provide accurate proportioning of the aggregate before drying, are featured. The feeders prevent aggregate deficiencies and avoid waste and rehandling of sizes which might normally overflow during the screening process.

Other types of feeding equipment shown include portable and stationary 2, 3, and 4-bin hoppers; apron, belt, and reciprocating feeders; belt conveyors; tunnel conveyor systems; and car-loading equipment.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 220.

There is a GM Diesel Engine Distributor Near You

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Montgomery 1
ALABAMA MACHINERY & SUPPLY CO.

ARIZONA—Phoenix
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MISSISSIPPI—Jackson, Louisville
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E. F. CRAVEN COMPANY

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WASHINGTON—Seattle 9
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Seattle 4, Anchorage, Fairbanks
YUKON EQUIPMENT CO., INC. (ALASKA)
Spokane
MODERN MACHINERY CO., INC.

WISCONSIN—Milwaukee 8, Rice Lake
DROTT TRACTOR CO., INC.

WYOMING—Casper
THE COLORADO BUILDERS' SUPPLY CO. (Equip. Div.)

GM DIESEL
CASE HISTORY No. 639-51
USER: Geo. M. Brewster & Son, Inc., Bogota, N. J.
INSTALLATION: Four GM Diesel-powered Ingersoll-Rand Gyro-Flo 600 compressors supplying air for 9 I-R 71 wagon drills.
PERFORMANCE: "Completely satisfactory," says operator Tom Malone. Units shown were delivering air to the tools through 1200 to 1600 feet of line--maintaining steady pressure of 100 to 110 psi.
It pays to STANDARDIZE on
GM
GENERAL MOTORS
DIESEL POWER

2400 CUBIC FEET OF AIR PER MINUTE ON NEW YORK THRUWAY ROCK CUT

Geo. M. Brewster & Son now operate a total of 18 General Motors Diesel-powered Gyro-Flo compressors, including this battery of four capable of supplying 2400 cubic feet of air per minute for rock drills on a section of the New York Thruway, near Kingston.

These modern rotary compressors take full advantage of GM Diesel's smoother-running 2-cycle operation to maintain a steady flow of nonpulsating air at 100 psi or better. And compactness of the GM 2-cycle design makes these units smaller and lighter for quick, easy movement from job to job.

This inherent engine design superiority—plus interchangeability of lower-cost parts, readily available through a world-wide GM Diesel service organization—explains why GM Diesel power is a favorite of contractors on so many jobs. Next time you order equipment, it will pay you to specify GM Diesel. Available as original or replacement power in more than 750 different models of equipment. Write us for complete list.

DETROIT DIESEL ENGINE DIVISION
GENERAL MOTORS • DETROIT 28, MICHIGAN
Single Engines . . . 16 to 275 H.P. Multiple Units . . . Up to 840 H.P.

Protex AIR METER . . .

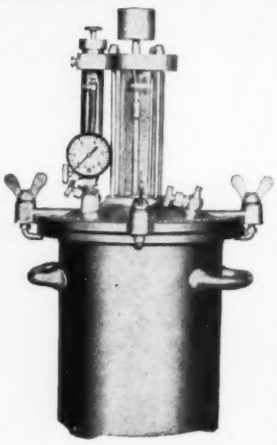
Improved 1953 Model

Faster . . . Easier . . . Better!

New Refinements on ¼ cu. ft. Air Meter

Built in Pump, very small amount of water, direct reading, lighter, more durable, etc. No supersensitive gauges requiring frequent calibration. Accurate in Laboratory work, rugged for field use, weight only 19 pounds.

PROTEX Air Meter has world wide acceptance and is of the approved type used by Government, State and Private Laboratories, and is known for its accuracy and durability over the past six years. No special training needed to get accurate results. Comes complete with Strike-off Rod and Standardization Vessel. Lowest in price—only $98.50, F.O.B. Denver. Optional Carrying Case $35.00. ½ cu. ft. Air Meter also available.



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Autolene Lubricants Company
Industrial Division
DENVER 9, COLO.

ONLY **$98.50** FOB DENVER
Carrying Case Extra

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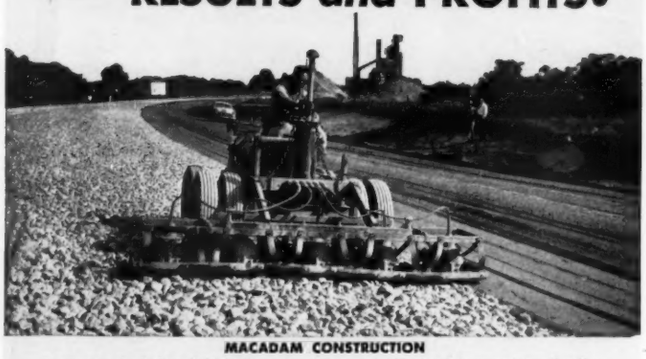
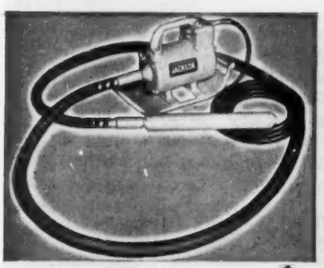


MACADAM CONSTRUCTION

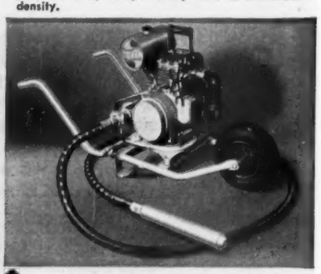
In one pass the Jackson Multiple Compactor will compact 12" of rock to support smooth rollers. In 4 passes compaction to final density may be obtained. With 2 passes all voids from top to bottom can be filled with fines. In gravel sub-bases 7" thick, one pass suffices to produce densities exceeding 100% Standard Proctor. Working speeds from 0 to 60 ft. per minute. 5½ MPH travel speed.

SOIL COMPACTION. The powerful, new, self-propelling Jackson Compactor, with 12" to 26" interchangeable bases, achieves specified density of granular soils in 8" to 10" depths at 2400 sq. ft. per hour. Perfect for bridge and pipeline fills, concrete floor sub-bases, etc.

BLACKTOP WIDENING & PATCHING. The same machine, operated from power plant on auto-trailer with pickup for Compactor, is most efficient means of blacktop pavement widening and patching, paving walks, drives, etc. Compacts 2400 sq. ft. per hour, close to maximum density.



GENERAL CONSTRUCTION. (left); 6 H.P. engine driven, flexible shaft vibrator. Excellent for both thin and thick sections. (Right); 2½ H.P. electric vibrator for light socket operation. Handy as a pocket in a shirt, powerful enough to handle all general construction concrete vibration with shafts up to 28'.



DUAL CURRENT PORTABLE POWER for operating all Jackson machines and lights. 1.5 to 7.5 KVA, providing both single and 3-phase 60 Cy., 120 V, AC (120/240 V in larger models). Permanent magnet generators require no adjustment or maintenance.

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LUDINGTON, MICHIGAN

Piling is driven into place for one of the cofferdam cells. L. B. Foster Co., Chicago, supplied the steel-sheet piling for the job.

Intake Structu[re] Almost After Being H[it] Rec[ord]

WITH WORK on the intake structure for a dam on Omaha's Missouri River almost finished, crews on the job can look at the river without a qualm. This was not always the case. It was the Missouri that gave workmen the most trouble on the job.

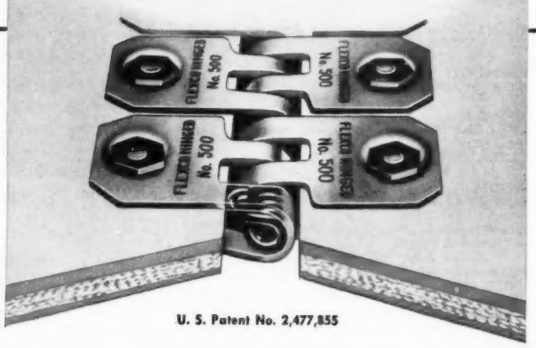
When the contractor on the job for the Omaha Public Power District, Parsons Construction Co., Omaha, Nebr., began work on the intake structure January 1, 1952, specifications called for a 30-foot-high cofferdam to be driven. The previous high-water mark for the Missouri at that point was approximately 988. But after the dam was driven and 40 per cent of the excavation work done, the river went on a rampage, engulfing the project in the worst flood in Omaha's history.

Cofferdam Built

Since the intake structure is located on the harbor line of the river, plans called for the construction of a cofferdam around the building and discharge tunnel. A steel-sheet piling circular-type cofferdam was erected, consisting of thirteen 30-foot cells and twelve 6-foot-radius closures, filled with about 18,000 cubic yards of earth. Rental steel-sheet piling was supplied by the L. B. Foster Co., Chicago, Ill. Work on the intake structure, designed to furnish coolant water for the North Omaha Power

. . . the new separable

FLEXCO HINGED BELT FASTENERS



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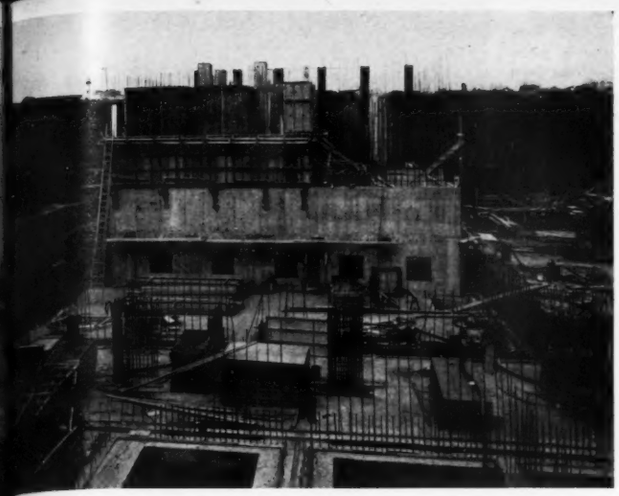

Intake structure for the Omaha Public Power District's dam takes shape inside a circ-type cofferdam, consisting of steel-sheet piling.

lmost Completed
Record Flood

Plant, was almost half done when construction was threatened by the flood. As the water rose, the contractor started to sandbag the top of the dam in an attempt to protect construction already in place. But after he added 4 to 5 feet of sandbags to the dam, it became apparent that the anticipated water level was higher than the levees above the project. Water finally reached a point 12 feet above the dam, and crews were forced to stop work until the flood crest passed. When the water receded, it was found that there were no heavy losses and only little or no damage from washing or undermining. The hole was pumped out and construction continued, and since then, the project has run into no serious trouble.

The 124-foot reinforced-concrete discharge tunnel is complete, and the intake building, measuring 85 x 90 feet, is complete to the finish floor of the 30-foot-high superstructure, which is built of structural steel and has brick walls. The height from the flow line of the intake to the finish floor of the superstructure is 46 feet. Like the discharge tunnel and the intake structure, walls, floors, and roof are of reinforced concrete, with walls averaging 2 feet thick. The foundation consists of a 3-foot reinforced-concrete base slab, anchored to solid rock by thirty 14-inch 117-pound bearing piles, which are grouted 17 feet into the rock.

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A Heavy-Duty Truck Crane that can Lift up to 20 Tons!

Gar Wood's 75BT truck crane gives you a specially designed, heavy-duty chassis for mobility and speed with full 40,000 lb. lifting capacity . . . Folding boom for easier handling in heavy traffic . . . High gantry, optional fluid coupling to absorb shock loads and power load lowering can't be beat for smooth, precision work! . . . Power actuated mechanical drum clutches, exclusive right angle drive, conical hook rollers and many other operating advantages for faster, easier work . . . The 75BT truck crane is quickly convertible to all attachments including the new, exclusive, profit-making Gar Wood Foundation Borer — the machine that bores and bells in one fast operation . . . Get details from your dealer—

TWO CRAWLER MOUNTED CRANES!

Standard-duty 75A and heavy-duty 75B models. With 35 ft. boom on 12 ft. radius a 75A lifts 16,500 lbs. and a 75B, 21,200 lbs. . . . Both are easily convertible *in the field!*

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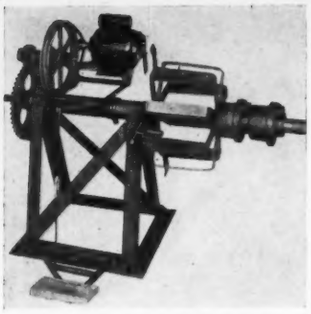

This wire-rope reeler and coiler with electric drive is made by Sherman & Reilly, Inc., Broad St., at First, Chattanooga, Tenn. The manufacturer reports that the electric drive has pulled off 5,000-foot reels of 5/8-inch wire without a hand-crank boost. The coiler carries reels with up to 44 inches OD and 18 inches wide. For further information write to the company, or use the Request Card at page 18. Circle No. 264.

Paving-Joint Sealer

■ A vulcanizing-rubber concrete-paving-joint sealer is announced by the Presstite Engineering Co., 3798 Chouteau Ave., St. Louis, Mo. The sealer can withstand repeated expansion-contraction cycles of pavements. It is not affected by extremely high or low temperatures and is resistant to high-speed impact of heavy loads, according to the manufacturer. It is also pointed out that the cold-applied sealer can be mixed and used safely and quickly.

The No. 99 sealing compound is furnished in two components, factory packaged in correct proportions: a liquid base component consisting of synthetic rubber, suitable plasticisers, vulcanizing agents, activator, and inert fillers; and a dry curing component consisting of accelerators with suitable extenders.

For further information write to the company or use the Request Card that is bound in at page 18. Circle No. 309.

Portable Air-Heaters

■ A line of portable forced-air heaters is shown in literature from the Silent Glow Oil Burner Corp., 850 Windsor St., Hartford 5, Conn. The heaters are made in two models that deliver 189,000 and 350,000 Btu per hour.

Both models can be operated to produce radiant heat at the unit area, forced warm air at distances up to 100 feet or at specified outlets anywhere along the main duct, and radiant heat along the entire length of the main duct. The units are furnished with a thermostat for automatic temperature control.

Mounted on rubber-tired wheels, the heaters can be moved about easily. Safety controls extinguish the fire immediately when the switch is snapped off or the power cut off.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 291.

According to the Research Institute of America, a $12,000 investment is required to put each individual who joins the employed roster to work.

Emergency Generators

■ Literature describing and illustrating generators designed to give emergency electric power is available from the Homelite Corp., 865 Riverdale Ave., Port Chester, N. Y.

Powered by gasoline engines, they are designed for use when storms, fires, floods, or accidents disrupt normal power supply. They are illustrated in models from 1,000 to 5,000 watts. No heavy or permanent base is necessary for their installation.

To obtain Booklet L-411 write to the company or use the Request Card at page 18. Circle No. 310.

The new Model 5 Lombard chain saw is available in various sizes from 20 to 40 inches. It also comes in a 22-inch bow model. The saw features an automatic clutch and rewind starter, automatic chain oiling and oil shut-off, and chain tensioning control. For further information write Lombard Governor Corp., Ashland, Mass., or use the Request Card at page 18. Circle No. 311.

ESTABLISHING MOUNTAIN-TOP BASE, a helicopter and a TD-24 put men, machinery and supplies on mile-high pass as first step in efforts to build road down to meet section coming up from each side. TD-24 pulled yarder, winch, and compressor into pass after bitter 7-day fight.

BigR

1 RAISING KENNEY DAM to fill the Grand Canyon of the Nechako River, workers sluice down some of the 3.8 million cubic yards of earth and rock it will eventually contain. Dam will form a reservoir with twice the capacity of Grand Coulee. TD-24 in foreground strips blasted rock from canyon wall abutment.

2 HEADING OPERATIONS at Kenney Dam are (left to right) Alcan Resident Engineer Harry Jomini; General Superintendent "Hak" Nielsen and Project Manager Jack Bremner, both of Mannix, Ltd., sub-contractor for Morrison-Knudsen Company of Canada, Ltd. 110 miles west, dammed-up waters will be diverted through mountain and dropped a half mile to run turbines in sea-level powerhouse.

3 DRIVING TEN-MILE TUNNEL through mountain is done from four headings. Here, half a mile above ocean-level valley, aerial tramway has delivered TD-24 to tunnel portal for working debris down mountain. 2,600 feet below, eight-story powerhouse inside mountain is being mucked out by a TD-24 and a TD-9.

Avoid Legal Pitfalls

Edited by A. L. H. STREET, Attorney-at-Law

These brief extracts of court decisions may aid you. Local ordinances or state laws may alter conditions in your community. If in doubt consult your own attorney.

Contractor's Right To Sue Union Is Declared

THE PROBLEM: *A Virginia construction company employing A. F. L. workers had contracts to construct coal-mining-plant facilities in Kentucky. A rival union of construction workers, affiliated with the U. M. W. A., in an attempt to supplant the A. F. L. unions, caused mobs of drunken, abusive, and armed men to picket the job sites. The company was thereby prevented from completing its contract. (1) Did it have a valid claim against the disrupting union for damages? (2) If so, was an award of $29,326.09 actual damages and $100,000 punitive damages excessive?*

ANSWERS: (1) Yes. (2) No. (United Construction Workers v. Laburnum Construction Corp., 75 S. E. 2d 694, decided by the Virginia Supreme Court of Appeals.)

The court cited numerous decisions of the United States Supreme Court and other appellate courts to sustain these conclusions:

The Federal labor relations statutes exclude right of states to regulate peaceful strikes for higher wages in industries engaged in interstate commerce. But this does not deprive state courts of jurisdiction to deal with unlawful conduct committed within their territorial limits in the course of labor disputes even if interstate commerce be affected.

The National Labor Relations Act, while providing legal means of restraining unfair labor practices, does not indicate that an employer is to be deprived of his common-law right to sue in a state court on account of violence and intimidation.

The evidence in this case abundantly showed that the leaders of the union which sought to supplant the A. F. L. union through intimidation, disrupted the contractor's relations with the mining companies by which the contractor had been employed.

Under Kentucky law, damages directly caused by the defendant union's wrongful interference were collectible by suit. The damages could cover loss compensation under cost-plus-fee contracts. But to justify an award of punitive damages it was necessary that malice, willfulness, or wanton disregard of the contractor's rights be shown.

Red TD-24 Pioneers New Frontier

59 International TD-24s spearhead largest integrated engineering program in history for Alcan (Aluminum Company of Canada, Ltd.) on Project British Columbia

A fleet of 59 hard-hitting International TD-24s is blazing a new frontier across 5,000 square miles of wilderness in British Columbia.

Twenty-four hours a day, they're on the go for Morrison-Knudsen Company of Canada, Ltd., prime contractor for most of the giant development that includes:

Building the largest sloping clay core dam in the world

Driving a subway-size tunnel ten miles through a mountain

Blasting out an eight-story powerhouse two blocks long inside solid rock

Erecting a transmission line fifty miles long over a jagged mountain range

Raising the world's largest aluminum smelter and a new port city at Kitimat where 50,000 people may eventually live and work.

A. O. Strandberg, project manager for Morrison-Knudsen, says:

"These TD-24s are doing the impossible. We never thought any tractor could go where these tractors are working now. They have the weight, they have the balance, and they have the power to get the job done."

And here's what superintendents on the firing line say:

Bill Richards: *"They're pushing boulders uphill we had to dynamite in the old days."*

Herb Wilkinson: *"I wouldn't believe where they'd go until I got them on my crew."*

John Hutton: *"They're doin' work up here they were never built for but they're doin' it just the same."*

Your International Industrial Distributor can give you the facts and figures on the TD-24. See him. You'll be a TD-24 man from then on in!

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POWER THAT PAYS

4 **INSPECTING MOUNTAIN TOP OPERATIONS** at Kemano, headquarters for construction of powerhouse, tunnels and transmission line are (left to right) A. O. Strandberg, Project Manager for Morrison-Knudsen; F. T. Matthias, Alcan Assistant Project Manager, and Walter Abrahamson, Alcan Assistant Resident Engineer at Kemano.

5 **LINKING UP POWER TRANSMISSION LINE ROAD,** a pair of TD-24s doze toward each other through blasted rock. Across 50 miles of rugged terrain like this, a mountain-anchored powerline will be built to flash abundant electricity from mountain powerhouse to smelter at tidewater.

6 **NEW LAND IS MADE IN OCEAN INLET** by dredge which deepens anchorage for ocean shipping at the same time. H. M. Whiting (right), Project Manager for Kitimat Constructors, Ltd., and a superintendent study progress. Part of this 70 acres of new land will become site of new aluminum smelter. Town which may eventually become city of 50,000 will be built across the bay.

Federal Control Over Bridge Plans

THE PROBLEM: *A Federal statute (33 U. S. C. A., sec. 491) provides when plans for a bridge in a navigable stream have been approved by the War Department, that it shall be unlawful "to deviate from such plans, either before or after completion of the structure," without departmental approval. Would conversion of a railroad-motor vehicle bridge by dismantling the roadway structures or involving elimination of 320 tons of beams, struts, stringers, and cantilevers from the structure violate the statute?*

THE ANSWER: Yes. (United States v. Ingram, 203 Fed. 2d 91, decided by the United States Court of Appeals, Eighth Circuit, reversing a decision of the United States District Court, Eastern District of Arkansas, 99 Fed. Supp. 91.)

The court noted that the Federal government can dictate the terms upon which structures may be placed in its navigable waters. Permission is in the nature of a privilege and not a mere regulation of rights, and so the conditions imposed by the government are final.

Contractors' Association Income Tax Liabilities

THE PROBLEM: *An association of metropolitan general contractors not operated for profit derived revenue from the operation of a bureau of quantity survey, which made available to individual members estimates of material and labor needed on particular projects. Was the revenue subject to Federal income tax?*

THE ANSWER: Yes. (General Contractors' Association of Milwaukee v. United States, 202 Fed. 2d 633, decided by the United States Court of Appeals, Seventh Circuit.)

It was unsuccessfully argued that in pursuing the particular activity, as well as other activities, the association was a "business league", within

(Continued on next page)

Avoid Legal Pitfalls

the meaning of a Federal statute exempting "business leagues". The court noted that a treasury regulation defines a business league as not carrying on a business ordinarily carried on for profit, and one whose activities are directed to the improvement of general business conditions in a given line, as distinguished from services to individuals.

Engineers' License Law Was Not Valid

THE PROBLEM: *A Colorado law enacted in 1951 purported to give a State board power to license those engaging in various branches of engineering, but did not define the branches nor fix any standards for classifying them. Everything was left to the board's determination and approval. Was the law unconstitutional?*

THE ANSWER: Yes. (Prouty v. Heron, 255 Pac. 2d 755, decided by the Colorado Supreme Court.)

The court applied the fundamental constitutional principle that legislative power cannot be delegated to an administrative board or official, although authority may be conferred to determine facts upon which application of a law depends.

Uncorrected Defects

THE PROBLEM: *On a contractor refusing to correct defects in his work, were the owners entitled, without remedying the defects, to hold the contractor liable for the reasonable cost of remedying them?*

THE ANSWER: Yes. (Greenwald v. Royal Indemnity Co., 245 Pac. 2d 115, decided by the California District Court of Appeal, Second District, Division 1.)

Killed While Off Duty On Foreign-Job Location

THE PROBLEM: *An employed consulting engineer was sent to Israel for a few weeks' work, with instructions to proceed to Greece to do further work there. He was practically through in Israel when he went on a sight-seeing trip, on which he was killed by hostile Arabs. Was his widow entitled to an award under the New York Workmen's Compensation Law?*

THE ANSWER: Yes. (Lewis v. Knappen Tippetts Abbett Engineering Co., 112 N. Y. Supp. 2d 79.)

Taxation Exemption

THE PROBLEM: *Is it possible that personal property taxation statutes and a Government construction contract may be so worded that the contractor's equipment will be tax free while on the site?*

THE ANSWER: Yes. (Bennett & White [Calgary] Ld. v. Municipal District of Sugar City, English Law Reports, Appeal Cases, 1951, pg. 786, House of Lords.)

So decided the highest judicial tribunal in the British Commonwealth, in vacating a decision of the Supreme Court of Canada and reinstating a decision of the Appellate Division of the Supreme Court of Alberta.

The Canadian government awarded a contract for diversion and irrigation tunnels in Alberta. The contract specified that "all machinery, tools, plant, materials, equipment, articles, and things whatsoever, provided by the contractor . . . for the works . . . shall . . . until final completion . . . be the property of His Majesty". An Alberta tax statute, provided for taxation of personal property in "the name of the person who is the owner or of the person who is in legal possession".

On the facts of the case, the House of Lords decided: The government was owner of the equipment for the time being and so it was not taxable. True, the equipment was redelivered to the contractor for the purpose of carrying out the contract, and under certain conditions, not present in the case, it could have been taxed to the contractor, as being one in legal possession. But, apart from other considerations, the tax was void because it was for a lump sum covering all the equipment, including motor vehicles, which were exempt from taxation by another statute.

Finally, it was decided that even if the motor vehicles had not been included in the single assessment, the assessment would have been void for lack of any provision in the tax statutes, manifesting intention that a contractor should be subjected to taxation because in possession of property technically belonging to the government.

A Sewer Contractor Was Bound to Foresee Flood

THE PROBLEM: *A sewer contractor knew that construction would parallel a river, and was required to examine the work site. Inspection showed that damage would probably result from floods occurring during the construction. Heavy losses were*

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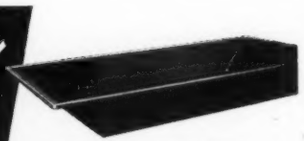

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encountered when the river overflowed and flooded the sewer tunnel. Was the contractor entitled to collect for the resulting extra work involved?

THE ANSWER: No. (McKay Engineering & Construction Co. v. Sanitary District of Chicago, 108 N. E. 2d 39, decided by the Appellate Court of Illinois.)

The court said that, although the District had kept records for several years showing flood levels, this fact did not obligate it to disclose the data voluntarily to the contractor, because the latter could have readily ascertained the extent of prior flooding.

The court distinguished the case from several instances in which the United States Supreme Court had upheld awards of extra pay for damages where misrepresentations had been made to contractors, or where the contracting authority had wrongfully concealed material facts, or where the contractor had been required to follow defective plans. The fact that the manhole covers were below flood levels did not render the district liable, because the circumstances were such that the contractor was bound to foresee and guard against flood damage.

Zoning Ordinance—Storage Yard Use

THE PROBLEM: *In 1936 a contractor began use of a block as a storage yard for materials and equipment and an unloading pit. The block was unsuited to residential use, but in 1942 was included in a residential district, subject to its continued use as a storage yard. In 1949 the block was reclassified as commercial. Did the city council act with discretion in making the reclassification, and was the contractor entitled to improve his facilities on the lot by extending a railroad spur across the block?*

THE ANSWER: Yes. (Kenny v. Kelly, 254 S. W. 2d 535. Texas Court of Civil Appeals, San Antonio.

The decision was influenced by the fact that the block had never been used, was not adapted to use for residential purposes, and had been used for many years as a storage yard.

Third Party May Be Liable on Contract

THE PROBLEM: *It is an elementary rule of law that a promise is not enforceable as a legal obligation unless there is a "consideration" for it, which is usually found in the other party's promise to do something or refrain from doing something. Defendants, highway contractors, sublet the furnishing of sand and fill materials, and the subcontractor, in turn, contracted with plaintiff to deliver the materials. Plaintiff suspended delivery because he was not paid by the subcontractor. If the contractors orally agreed with plaintiff that they would see that the latter was paid for all deliveries, past and future, on plaintiff resuming deliveries, was there sufficient legal consideration to make the promise binding?*

THE ANSWER: Yes. (Naples v. McCann, 95 Atl. 2d 158, decided by the Appellate Division of the New Jersey Superior Court.)

A lower court had dismissed the suit, but the higher court ordered a new trial for submission to a jury of the question of whether there was such oral agreement as was alleged by the plaintiff.

Concrete Manufacturer Had Lien Rights as Materialman

THE PROBLEM: *A manufacturer furnished a large concrete septic tank in three sections to a building subcontractor, delivering it into an excavation and cementing the sections together, one on top of another, plus a lid. In mechanics' lien proceedings by the subcontractor was the manufacturer properly listed as a materialman?*

THE ANSWER: Yes. (Rebisso v. Frick, 112 N.E. 2d 651, decided by the Ohio Supreme Court.)

The court compared its decision with that reached in another case where a manufacturer of woodwork for incorporation into a structure was declared to be a materialman for lien purposes, and concluded that the fact that the woodwork may have been fabricated on the manufacturer's premises instead of being assembled on the construction site did not call for application of a different rule of law.

Let's roll up our sleeves today and give to the Red Cross Blood Bank.

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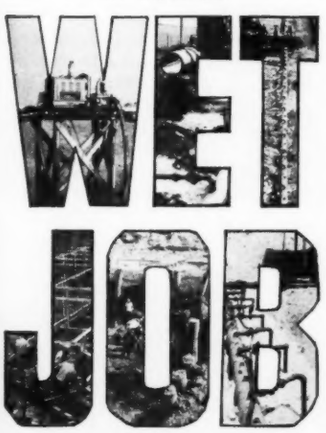

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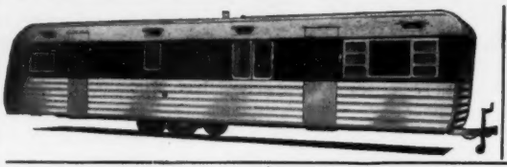

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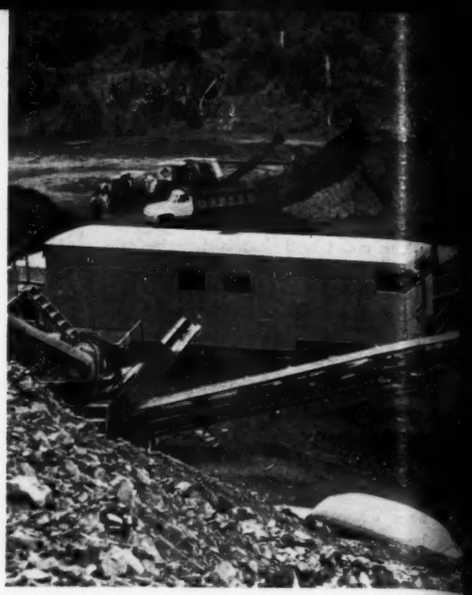

The crusher plant. Components included a Pioneer jaw crusher, two Pioneer roll-crushers, and a Telsmith 4-foot crusher.

Ray Day Photos

Highway Is Extende

FROM THE WILLAMETTE VALLEY of Oregon to the Sacramento valley of California, U. S. 99 passes through terrain so mountainous that motorists refer to the highway as "the road they never finished". Taking the uncomplimentary description in good faith, the Oregon State Highway Commission is doing its best to eliminate it. One new section after another is being opened to traffic through this difficult country just as soon as it can be constructed.

Such a section has just been finished near Divide, Oreg., about 150 miles south of Portland. The J. C. Compton Co., McMinnville, Oreg., has laid 40,000 tons of plant-mix surfacing to complete work which began early in 1952. The Compton firm subcontracted the paving job from Fred H. Slate Co. and E. C. Hall Co. of Portland. Slate-Hall was awarded the original $1,530,464 contract calling for grading, drainage, base and paving work on 5.63 miles.

The same damp conditions, both above and below ground, which made early work difficult were present to hamper paving crews. In spite of weather conditions, however, which often caused hot-mix aggregates to drip at the cold elevator of the asphalt plant, the 40,000-ton job was paved in record time.

Makes Modern Highway

The work which has recently been completed brings this part of U. S. 99 up to modern four-lane, limited-access standards. A roadbed 80 feet wide was created by the grading work so that two 26-foot traffic lanes and 9½-foot shoulders could be accommodated. The slopes were flattened to a ratio of 1½ to 1, even in rock, to reduce maintenance costs.

Granular subbase was planned on the basis of 3-inch-minus crushed rock, laid in a ribbon up to 15 inches thick, heavily rolled. Asphaltic concrete surfacing consists of a 2-inch base course topped by 1½ inches of surface course. The pavement is sealed with asphalt and chips to make it waterproof and to improve traction. The pavement surface slopes 0.018 outwardly from a center crown to facilitate drainage.

Major quantities were sizable.

(Continued on page 112)

Barber-Greene finisher lays the hot-mix material. Eight trucks were used to haul the mix from the asphalt plant to the job.

Long Lasting Weatherproof Visibility

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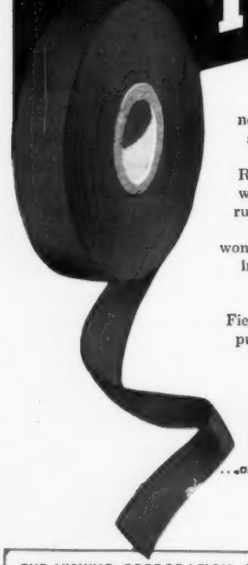
NONWOVEN
Flagging Tape



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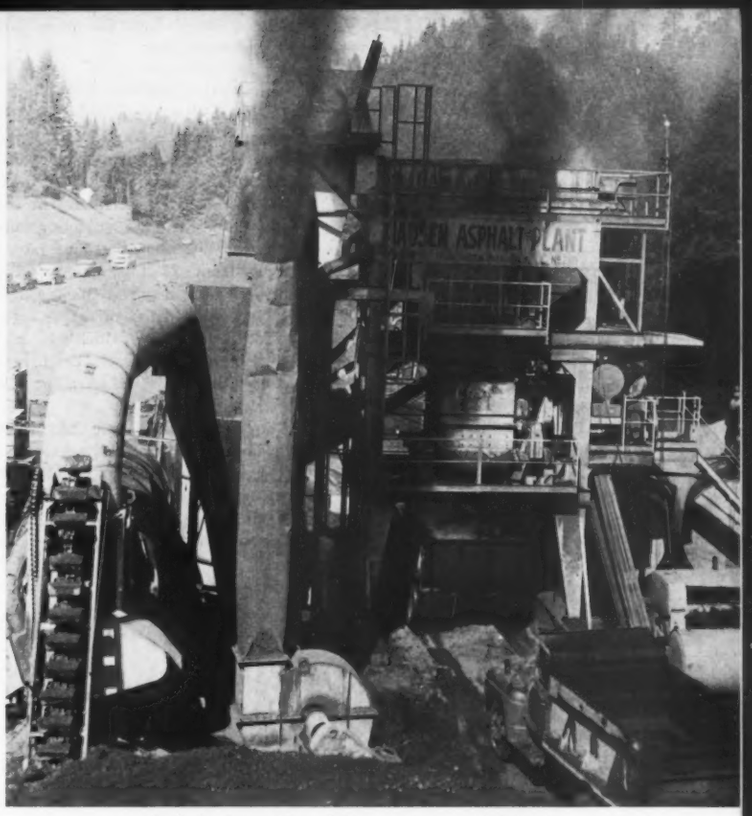

Trucks load up with asphalt concrete at a Model 481 Madsen plant, purchased for first use on this job.

Over Rough Terrain

New asphalt plant mixes 40,000 tons of asphaltic concrete for 5.63-mile addition in mountain section

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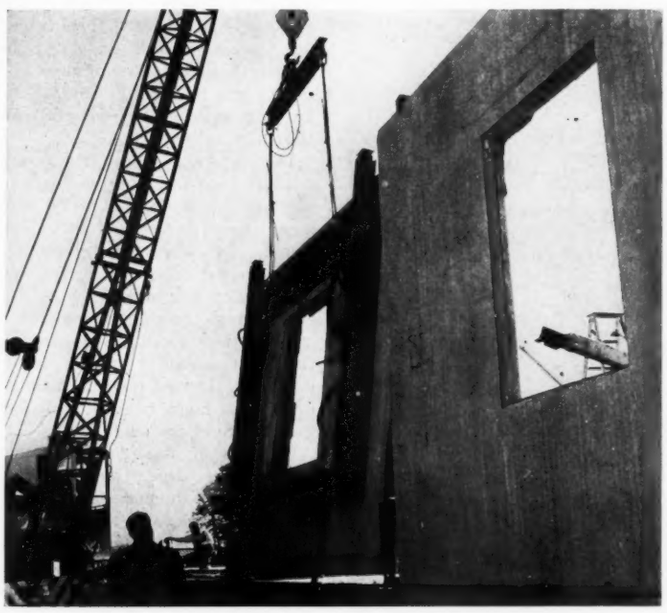

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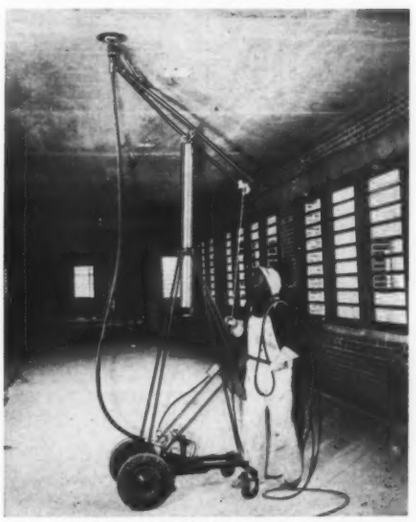

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● With the grinding head automatically held against the ceiling at the proper pressure, the operator needs only to guide the machine.

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Highway Is Extended Over Rough Terrain

(*Continued from preceding page*)

The original plan called for 1,217,000 cubic yards of unclassified excavation, and more than a quarter of a million cubic yards of that total turned out to be solid rock. There were channel changes, some up to 1,000 feet in length, to make a straight-line path for an adjacent stream. The rock-crushing job for the granular base totaled approximately 75,000 tons.

Concrete and corrugated metal pipe from 24 to 84 inches in diameter was used in the drainage plan, and there were a few sectional plate culverts, with walls from 5 to 8-gage, as big as 138 inches in diameter. Completion of all these items took about a year, and it is over all this previous work that Compton laid the asphalt paving.

Paving Is Major Item

In line with other sizable features of the project, construction of the asphaltic concrete paving was a big-scale item. Plans called for 40,000 tons of plant-mix surfacing in the new section. The heavy paving tonnage was necessary because paved widths from 24 to 52 feet were specified, with a paved thickness of 3½ inches. This thickness was divided between the 2-inch base and 1½-inch surface courses. Both were made with 85-100 penetration asphaltic cement.

Compton's crews ran into their weather difficulty almost as soon as they moved in. The Pacific Northwest experienced one of its wettest seasons during the spring of 1953. Rains almost every night and sometimes during the day slowed the job down and made things doubly difficult for the asphalt-plant dryer. Still work went ahead rapidly.

The Compton firm prepared for the big paving assignment by ordering a new Madsen 4,000-pound Model 481 asphalt plant, No. 218, which was set up so that extreme-length hauls amounted to approximately five miles. The plant was set up on U. S. 99 about 2¼ miles below the aggregate and subbase rock production site. This paving was the first job for the new plant, one of the first seven of its line.

The plant made use of a Clayton 50-hp steam boiler for heating steam coils in the asphalt storage tanks and for operating the pugmill, which was steam-jacketed outside. The pugmill rams, however, were operated by air. Aside from this use of steam, the balance of plant operation was electric. A Caterpillar D375 diesel with a 275-kw generating set produced enough electricity to run the plant dryer, screens, and other components through individual electric motors.

Rock aggregates for the mineral filler in the plant mix were produced by the prime contractor at the time the subbase material was being made to cover the graded area. The best source of suitable rock for this purpose was at the top of a mountain peak 2¼ miles from the hot-plant, in a site where rock production amounted to a 100 per cent crushing job. Hauling downhill over the steep grade created a further problem. Vacuum-actuated water sprinklers had to be rigged up to spray cooling water on truck brakes as the units moved downhill.

The Rock-Plant Setup

The rock-plant setup for such a heavy crushing job emphasized heavy-crusher production. Plant components included a Pioneer 30 x 42 jaw-crusher, two sets of Pioneer 40 x 22 roll-crushers, and a Telsmith 4-foot crusher. Power for individual electric motors came from a D397 Caterpillar diesel engine and the screening work was done by two sets of Pioneer vibrating units, consisting of 4 x 20 and 4 x 10-foot decks. The crushed base-course material for subbase was hauled down to the highway by trucks and put in place with moisture, blading, and sheepsfoot rollers. Minerals for the hot-mix were stockpiled at the crushing plant site. Unfortunately, the tonnage of this material was underestimated. The prime contractor had to bring in and set up the plant again in the spring of 1953 after moving it out in 1952.

The hot-mix aggregates were stockpiled in front of the Madsen plant so that a Caterpillar D8 and dozer could shove it to the plant feeder. This hopper fed down directly to the cold elevator on the plant, which then started the aggregate through the plant system. Because of rainy conditions, the material often contained enough water to drip off the cold elevator, making things that much more difficult for the balance of the plant.

In spite of this condition, the single plant dryer removed the moisture from the material, dropped it to the hot elevator where it was sent up to the 2½-deck Symons sizing screens, classified for a 3-bin separation, then dropped to weigh-hoppers which had a total storage capacity of about 40 tons.

Asphalt of 85-100 penetration grade was furnished by the Portland refinery of American Bitumuls Co. and was hauled to the project at flow temperature by a fleet of transport trucks capable of bringing down 6,000 gallons, or about 20 tons, per trip. The loads arrived on the job at flow temperature and were dropped by gravity or by asphalt pumps on the truck to the asphalt storage system. Two tanks, one of 6,000 and one of 12,000-gallon capacity, held this material and supplied the plant.

There were two main asphalt pumps: a Kinney 3-inch unit which took care of asphalt circulation and another Kinney 3-inch unit which supplied asphalt to the pugmill.

Does work of larger graders at half the cost . . . *with help of TIMKEN® bearings*

THE Galion 503 Model Motor Grader does most jobs as efficiently as larger graders, yet at half the cost with the help of Timken® bearings on front wheels, tandem drive and idler pulleys.

The dirt, dust and mud this grader works in call for effective closures. By holding housings and shafts concentric, Timken bearings make closures more effective—keep lubricant in, dirt and moisture out. Result: less maintenance on the grader, more maintenance on the road.

With Timken bearings on the tandem drive, greater driving power is assured, bigger loads can be handled. Full line contact lets Timken bearings handle these heavy loads with ease.

Be sure to specify Timken bearings in the machines you build or buy. Look for the trade-mark "Timken" stamped on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

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How THE GALION IRON WORKS & MFG. CO. mounts the tandem drive grader axle of its Model 503 Motor Grader on Timken bearings for minimum maintenance, long life.

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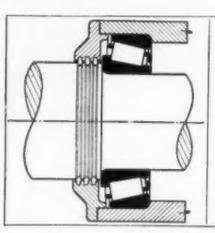
TAPERED ROLLER BEARINGS



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Because Timken bearings hold shafts concentric with housings, closures are made more effective. Lubricant is retained, dirt and moisture kept out.

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Other storage equipment consisted of an 8,000-gallon fuel storage tank, which held the PS-300 dryer-drum fuel. A smaller tank held ordinary stove oil which was used by the plant boiler.

When CONTRACTORS AND ENGINEERS visited the job, the plant was turning out 150 tons per hour, and weather conditions were still rainy.

Rapid Laydown

As rapidly as the Madsen plant turned out the material, it was hauled to the highway and laid by a fast-moving street crew under the experienced supervision of Fred Walker. Both courses of plant-mix were laid over a prime coat of RC-3 American Bitumuls asphalt, which had been applied earlier. Originally, it was Compton's intention to shoot the RC-3 prime coat about a week ahead of paving, but rain upset the plans. As it worked out, it was three weeks after the prime was down before paving was done. During those three weeks, the prime coat succeeded in emulsifying to some extent under the action of rain and traffic so that considerable patchwork had to be done just before paving.

The RC-3 prime was hauled down from Portland by transport trucks, transferred to a distributor, and shot in width increments up to 21 feet.

The plant-mixed asphaltic concrete was hauled out to the job either by contractor-owned or by rented trucks. Fords and Internationals were used in two sizes. The larger trucks hauled six 4,000-pound batches per load, while the smaller units hauled four 4,000-pound batches. As the truckloads came up to the Barber-Greene finisher, they made a partial dump in the conventional manner, and the laydown machine operator then moved the trucks on ahead with the power of his machine. Eight trucks were enough to handle the operation.

The laydown operation was set up so that a strip could be carried from one end of the job to the other as far as it went. There was no turning back in the middle of the day, and the machine kept right on through the job with its laydown run. The 52-foot pavement was placed first. Later, a minor percentage of 24-foot highway was laid to round out the job.

The base course was laid down thick enough to compact to a 2-inch thickness, and the top course was laid to give 1½ inches of finished pavement.

Rolling was a job for two steel-wheel machines, both Buffalo-Springfields. A 3-wheel tandem machine, rated at 8 to 12 tons, made the breakdown roll, and finish rolling was done by a 6 to 8-ton machine. The finished asphalt mat was dense, smooth, and durable.

Personnel

The project was handled under the general supervision of the Oregon State Highway Commission, with R. G. Baldock as state highway engineer, and H. G. Smith as construction engineer.

Field officials on the paving spread included General Superintendent D. J. Holmes, Plant Foreman Sam Welch, and Laydown Foreman Fred Walker. Operations of Slate and Hall, prime contractors, were directed by General Superintendent E. E. Anderson, Grade Foremen James Ringsmeyer and Hugh Jenkins, and Master Mechanic Gordon Beebe. THE END

Hydraulic Controls For Angle-Dozer Blade

■ An angle-dozer that can be shifted from the tractor seat is announced by the Shawnee Mfg. Co., Inc., 1947-M N. Topeka Ave., Topeka, Kans. The new hydraulic angle-dozer can be shifted up, down, to the right, and to the left as required.

A further feature of the dozer is a blade that can be adjusted manually. It can be shifted approximately 24 inches to the right or left and the horizontal angle of the blade can be tilted up to approximately 20 degrees.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 189.

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MONARCH ROAD MACH. CO.
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Northern Commercial Co. operates, along with its distributor section, one of Alaska's most modern department stores. *Ray Day Photo*

Alaskan Distributor Handles Everything

Northern Commercial Co., dealer for Caterpillar and other large manufacturers, also sells baby nipples and coffins

LATE LAST FALL, with less than six weeks to go before the autumn freeze, a radio message crackled across the airwaves of the far north. The message originated on an island of solid ice drifting in the Arctic Ocean. U. S. scientists and airmen were on the island, which, at that time, had only a code name. Their message told of a fantastic construction scheme.

If the island's free water, which had melted during the summer, could be pumped to a certain location and contained in a level pond until it froze again in the fall, the smoothest airplane runway ever created would be the result. Could, the scientists wished to know, a heavy-duty pump, possibly mounted on the power takeoff shaft of a tractor, be flown from Peoria to the questionable location of the ice island in a matter of a few days? The tractor had to be equipped with a heated cab, lights, ether starting help, and a high-capacity pump for the water job.

Only 72 hours after the radio message reached the Anchorage office of Northern Commercial Co., the equipment had been delivered in Alaska and was on its way to the arctic on an Air Force C-124 flying boxcar. To officials of Northern Commercial's Anchorage office, the unusual request was routine business which the company has come to expect after many years of trading in the arctic. When the radio message came in, Anchorage immediately wired Seattle, Wash. Seattle's Northern Commercial office contacted Caterpillar Tractor Co. in Peoria, and the tractor was on its way. Another example of Northern Commercial's unique service policy had been demonstrated.

Northern Commercial Co. officials are fond of comparing the likeness of their far-flung arctic operations with that of any stateside equipment distributor, but in countless respects the operations are strikingly different. The Anchorage office of the company, for example, is 1,460 miles from Seattle headquarters and 1,800 miles from some of the construction areas far out on the Aleutian chain. Any shipment of equipment or parts, unless it is by air, automatically adds from 15 to 45 days between the U. S. and Anchorage. Also, heavy equipment distribution in the far north is a constant balancing of predicted government defense spending on the one hand, and an incredibly short working season on the other. The year is about evenly split between effective construction working time—which means sales—and winter idleness.

Much of the arctic country in which Northern Commercial operates is frozen over until May 1. By October 1, winter snows have again set in to curtail all but emergency construction which can be done under the protection of tents or tarpaulins.

Defense Spending Governs

Because of Alaska's strategic position, defense spending governs Northern Commercial's heavy machinery sales and service operations to a great extent. Each year, shortly after Christmas, officials of the company's many far-flung branches have the difficult task of predicting what the trend in defense spending will be. They must then place orders for machinery and parts, gambling on the accuracy of their predictions. Usually their fore-

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Provides swift, dependable, economical thrust washer replacement. No costly dismantling necessary. SABECO split thrust washers are made of time-proven SABECO Bronze for long life and top performance on all heavy-duty jobs. Available in any practicable size to your specifications.

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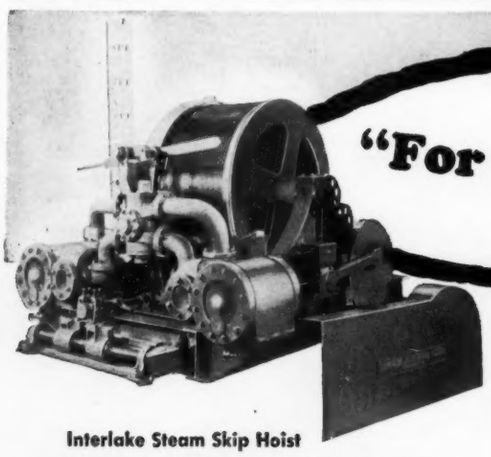

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Interlake Steam Skip Hoist

The steam skip hoist shown will replace a veteran unit now ready for retirement and provide continuous 24-hour-a-day service.

Consult with Superior-Lidgerwood-Mundy Corporation. Lidgerwood Quality Hoisting Equipment provides:

- **Length of Service**
  Many hoists have been in service for over 50 years.
- **Length of Operation**
  Drum capacities of 5280 feet, one mile, have been provided for Penstock work.
- **Durability**
  24 hours a day, day in, day out is typical of the built-in durability of Lidgerwood equipment.

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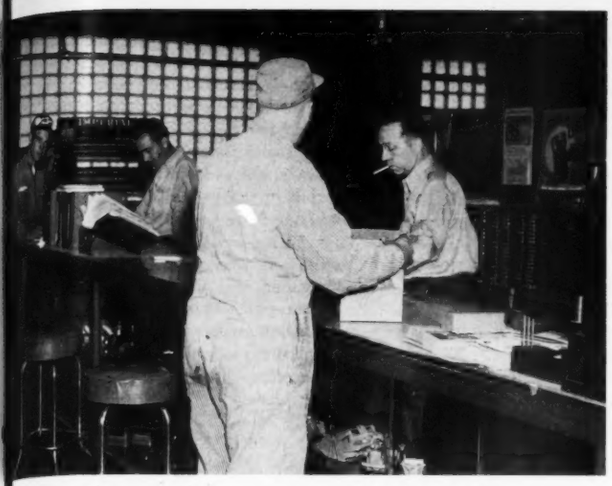

Over-the-counter sales are an important part of the firm's business.
Ray Day Photo

casts are fairly correct. Sometimes they are not. Last spring, for example, a sudden Defense Department freeze order stopped work completely until projects could be re-evaluated, after equipment and parts had already been ordered for a rush work season. There was about a six-week delay while the freeze was on, and contractors were reluctant to order parts, equipment, or materials.

Practically all the projects qualified for construction when they were restudied, so very little damage was done to the over-all program. But a company service devoted to a commodity as flexible and nebulous as defense spending cannot depend on such lucky breaks all the time. Next year, for example, is a biennial fiscal year, and guesswork alone can determine what, if any, Alaskan construction jobs will come up for bid during the first six months, when congressional appropriations will be made known.

The difficulties involved in operating a heavy-equipment distribution business in the far north without overstocking are enormous. The heating bill for storage and office space in any one of Northern Commercial's business establishments alone would make an equipment distributor in California, Alabama, or Florida howl with anguish. It is practically impossible to store expensive stocks or machines out-of-doors in the winter. At the same time, the stock of machinery and parts cannot be neglected. The short construction season demands immediate service. Northern Commercial's customers must have a brand of service equal to or superior to that supplied in the U. S.

An indication of how well Northern Commercial has made out on its predictions is the Anchorage percentage figure on orders filled directly from stock. Last year, of all the business orders received for equipment or parts, 92.58 per cent were filled from stock. The remaining orders arrived by boat or were flown in if necessary. Air freight from the U. S. for Northern Commercial represents a sizable percentage of the air freight tonnage handled in that city.

Many repair job orders are transmitted from the field by bush pilots. They often involve flying trips for mechanics to points deep in primitive country. The company services not only construction equipment, but also equipment used in mining, logging, and other allied industries in the Alaskan Territory. The mechanical crew usually totals six men in winter and four in summer, and it is busy all the time.

Perhaps the most dramatic difference between Alaskan and stateside equipment distribution is Northern Commercial's length of service. The

(*Continued on next page*)

Trailer-Mounted Floodlight Unit

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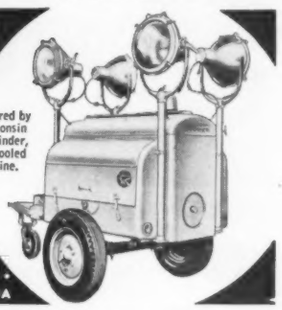

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A profitable tool with many uses!

BARCO *Gasoline* **HAMMER**

ONE MAN OPERATION! NO COMPRESSOR NEEDED

HERE'S why owners of the *improved* Barco Gasoline Hammer are enthusiastically acclaiming it as *"A Profitable Tool With Many Uses!"*

- New ignition system—quick, easy starting; trouble-free.
- Quick cable disconnect at handle. New handle design; switch convenient to operator's thumb.
- More portable than ever! Easily taken to any location by car, truck, or light plane.
- Versatile! A handy tool for Pavement Breaking . . . Cutting . . . Digging . . . Rock Drilling . . . Frost Breaking . . . Rod Driving. Ideal for general utility, standby, and emergency service.
- Economical! Low first cost, low operating expense, low maintenance expense. Quickly pays for itself.
- Powerful, rugged. Up to 1550 strokes per minute.

ASK FOR A DEMONSTRATION — See for yourself — ask for our nearest distributor to give you a demonstration.

Send for a copy of this interesting new Bulletin No. 613 — "BARCO GASOLINE HAMMERS".

BARCO *Manufacturing Co.*

518M Hough St., Barrington, Illinois
A Chicago Suburb

PAVEMENT BREAKING — Used by municipalities and utilities to make street openings, break curbs, and cut trenches.

ASPHALT CUTTING — An easy, fast job with a Barco Hammer.

EMERGENCY WORK — Day or night, one man can take tool to any location.

GASOLINE HAMMERS AND RAMMERS

MODEL 07AH
750 watts
Dolly-mounted

Plug-in* Electric Power

When you need it!
Where you need it!

ONAN *Portable* **Electric Plants**

ONAN Portable Electric Plants:
Gasoline powered — 400 to 10,000 watts. A. C. (60 and 180-cycle), and D. C. models.

Write today for **FREE** *Folder*

* There's no long costly waiting for electric power with portable Onan Electric Plants on the job. Easily wheeled or carried around; furnish instant *plug-in power* for saws, planers, drills, sanders, pumps, pipe-threaders, electric hammers, lights, etc. High capacity electric plants for large jobs can be brought to the site on truck or trailer.

Onan *4-cycle* engine-driven electric plants *start easier, run longer without attention, give more years of dependable service.*

Make more profit on every construction job with portable Onan Electric Plants.

D. W. ONAN & SONS INC.

7481 University Ave. S. E. • Minneapolis 14, Minnesota

history of the company goes back nearly 200 years, when it was part of a fur trading and commercial establishment operated and owned by the Imperial Russian Crown. Few U. S. equipment distributors can trace their lineage to such a unique origin.

In many other respects Northern Commercial Co. is similar to many U. S. firms. Consider these words of Volney Richmond, Jr., president of the company:

"Supplying the needs of the north is our business. It is our opportunity to meet the responsibility and purpose of our existence as a company. Many of our customers work only a few months in a year, those between thaw and freeze. These people will be looking to us for their needs. Let us determine individually and as a whole to give them our very best service and attention —make them happy. They gave us their order.

"There is no substitute for sincere interest in a customer's problems. When we help him, we help ourselves."

The general framework of this policy governs the company in all its business dealings. Contractors who have been in Alaska for several years report that Northern Commercial does about as good a job as anyone could reasonably expect under such adverse conditions. These contractors know they can buy a Caterpillar D8 at the Anchorage office for the same price they would pay in Denver, San Francisco, or any other place, except, of course, for the freight charges. Freight costs on a D8 between Peoria and Anchorage run approximately $3,700. This charge is flexible and depends on the amount of auxiliary equipment ordered with the tractor.

This equality of price is quite an achievement, considering the fact that labor in Alaska is considerably higher-priced than in the U. S. Also, such profit-reducing items as large heating, lighting, and communications bills take their toll. Many contractors, interviewed at random by CONTRACTORS AND ENGINEERS, expressed amazement that Northern Commercial could do as good a job as it does.

When an impending parts shortage crops up—and brings about another ordering headache—it seems to be a custom of Government agencies in Alaska to impound, by wholesale purchase, the parts Northern Commercial has in stock. The company will find itself in the clear for five months on some item, only to have to order frantically again when some agency swoops down with a purchase order for its whole stock to meet some impending crisis. Northern Commercial is, of course, happy to have the business, but such operating conditions create a serious hardship as far as normal business schedules are concerned.

The company bids regularly for parts supply on Government work. It also has factory tools available, either for rent or purchase, or for equipment repair in the field. The mechanical crew of the heavy machinery division is always available for equipment service. In these respects the company differs little from stateside organizations.

Tremendous Organization

But all similarity between Northern Commercial and stateside operators ceases here. The far-flung divisions of the company are so fabulous that they scarcely belong in the equipment distributor classification. People in the Arctic say that Northern Commercial supplies everything people need from the cradle to the grave, and, as a matter of fact, the company does sell nipples, coffins, and practically everything in between.

Northern Commercial's business extends throughout Alaska—from the Aleutian Islands to the Arctic Circle—and covers the Yukon Territory in Canada, as well as parts of western Washington. The company employs about 550 people regularly, plus a number of seasonal workers.

The firm originated in 1791, when a trading post was established at Unalaska by two Russians, doing business as the Golikov-Shelikov Co. This later developed into the Russian-American Fur Co. under Alexander Baranof, with posts from Sitka to the Bering Sea. When Alaska was purchased by the U. S. in 1867, Hutchinson, Kohl & Co., an American syndicate, took it over and changed its name to Alaska Commercial Co. By 1901 the commercial end of the operation became known as the Northern Commercial Co.

The present organization began July 1, 1922, when Volney Richmond, who had been general superintendent of the old firm for many years, joined with some associates to purchase the interior Alaska and Yukon Territory trading posts of the company. Headquarters were established in Seattle the following winter, and the main office has remined there ever since. Other key people in the present setup include Truman Sage, general manager of the machinery division, and Howard Stephens, vice president. Volney Richmond, Jr., is now president.

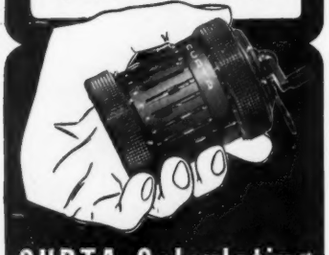
Present activities cover six main divisions: mercantile, machinery, automotive, aviation, Canadian, and home office.

Huge Mercantile Business

The mercantile division has 21 branches in Alaska, and three in Yukon Territory. They range in size from the large Anchorage branch, where an average of 85 people is

SLIDE RULE PORTABILITY!

CALCULATOR ACCURACY!



CURTA Calculating Machines--lowest priced complete calculators on the market.

Field Work — distance and weight figures

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At The Board—blueprint specifications

Inventory — totals wherever you go

In a special shock-proof case, the Curta model II calculator weighs but 12 oz. Fits easily in brief-case, desk drawer, jacket pocket, or glove compartment.

Life-time anodized finish, engraved dials, arctic and tropic-proof all-metal construction.

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For complete descriptive Literature, or 10 DAY FREE TRIAL

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CURTA Calculator Co.

3851 W. Madison Street
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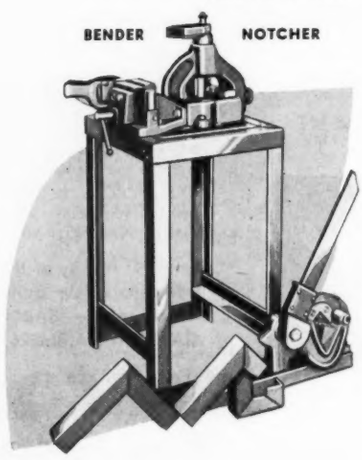
WHITNEY-JENSEN

METAL WORKING TOOLS

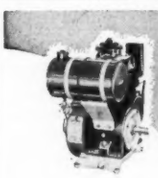
FOR 43 YEARS



NO. 455
ANGLE IRON
COMBINATION

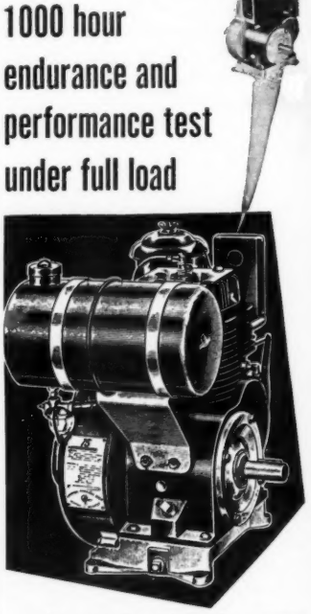
An unusually strong and compact unit for shearing, notching, and bending angle iron. Adaptable for on-the-job work or permanent mounting in the shop. Floor space required — 21-½" x 26". Capacity — all sizes angle iron up to and including 2" x 2" x ¼". *Write for our new Complete Catalog.*

WHITNEY METAL TOOL COMPANY • 720 FORBES ST., ROCKFORD, ILL.



MODEL 75 - 7 H.P.
MODEL 50 - 5 H.P.
MODEL 40 - 4 H.P.

GLADDEN ENGINES successfully pass 1000 hour endurance and performance test under full load



This rugged test definitely separates "the men from the boys". It demands stamina, dependability, and consistent powerful operation from an engine. Operating under a full load Gladden Engines successfully performed day after day without failure.

On important construction jobs where full operating days mean the difference between profit and loss, it is important that dependable power be available at all times. Past on-the-job records prove that GLADDEN ENGINES will operate day after day under the severest operating conditions with consistent dependability.

For further information on the complete line of GLADDEN ENGINES, kindly write

GLADDEN PRODUCTS CORPORATION

635 W. Colorado Blvd., Glendale 4, Calif. Dept. 101

employed, to Black River, a subpost of Hamilton, where one person runs the show. The largest department store on the continent north of Edmonton, Alberta, is operated by the company in Anchorage. It began with the operation of a small commissary for the Alaska Railroad in the late 1920's. The company bought two Anchorage business firms in order to modernize and expand its operation, and now the department store is Alaska's finest.

The Fairbanks branch has been in operation since 1904. Here, as in Anchorage, the customer can buy food, clothing, hardware, furniture, sporting goods, dry goods of all kinds, and heavy equipment. Mercantile business sales are booming at Anchorage and Fairbanks due to military construction programs centering in those areas, along with an increasingly active mining business.

Along the colorful Yukon and Tanana Rivers, the company river stations supply the needs of fur trappers and gold miners. Fur and fish form the basis of the Yukon area economy, where Hamilton and its subposts are located. In fact, the company itself operates a small cannery at Kwiguk and Mission, where Yukon king salmon—the world's best—is packed.

The St. Michael installation still includes a trading post, but it is chiefly noted as headquarters for company lighterage operation. Ocean vessels discharge cargo to barges off St. Michael, and from there the barges are towed by shallow draft tugs to Yukon delta and river points as far as Marshall.

Eagle, an especially scenic spot on the Yukon, is one of the upriver branches. When connected by a highway with the Alcan, it should become a tourist center. Another branch is located just inside the Arctic Circle. This is Fort Yukon, the fur center of the north, where trade with trappers predominates.

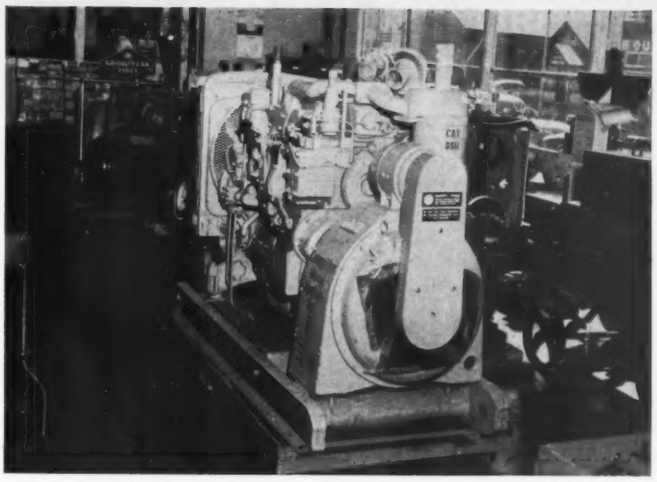
On the Kuskowim River there are three branches which supply the needs of trappers, miners, construction people, government airways, transportation firms, and residents of the area. The Nome branch, another mercantile location, depends on air transportation for its supplies, except during the ice-free season between June and October. This branch carries an exceptionally large inventory for the long winter season. The store is well equipped and carries everything the people in its area need.

Unalaska, most westerly of the mercantile branches and the site where the firm was founded, does its main trade with native Aleuts who work on the Pribilof Islands during the fur-sealing season. It is also a supply point for residents of the Aleutian chain. The company also has four mercantile branches in Yukon Territory, with a purchasing agent at Vancouver to handle the buying, shipping, and expediting of materials. The White Horse branch is the most modern department store in Yukon Territory. It contains a self-service grocery and offers hardware, appliances, furniture, shoes, dry goods, and women's fashions. Its permanent staff totals 17.

The Dawson branch was almost completely destroyed by fire in December, 1951, but has been rebuilt and expanded. The company also operates a petroleum products tank farm at Dawson. A similar branch at Mayolanding, near Keno, center of the present silver and lead mining boom, rounds out the system. Here, furs are traded for food, general hardware, and clothing.

Seven Machinery Locations

Heavy machinery distribution branches are operated at Ketchikan, Juneau, Anchorage, Fairbanks, and Nome, Alaska; at White Horse and Dawson, Yukon Territory; and a marine store (NC Marine) at Seattle. New machines, replacement parts, and mechanical service are offered by these stores. Field sales and service coverage of the territory in all machinery markets are made through them. Markets include mining, construction, fishing, logging, farming, transportation, and governmental agencies.



A Caterpillar diesel electric set occupies a prominent place in the display room.
Ray Day Photo

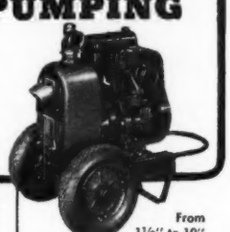
In addition to Caterpillar, many other prominent machinery lines are handled. A few of them are Blaw-Knox, Broderick & Bascom, Bucyrus-Erie, DeWalt, Goodyear, Hyster, John Deere, Joy, Lincoln Electric, McCulloch, Pioneer, Rex, Sauerman, Willard, Wisconsin, and Witte. These and other outstanding lines, plus on-the-ground facilities for parts and service, give Northern Commercial Co. a favorable position over competitors.

The mercantile branches assist the machinery division by being alert to the machinery needs of their customers and relaying leads for follow up.

NC Marine, located on Lake Union in Seattle, handles Caterpillar marine sales and services and represents other marine equipment lines throughout western

(Concluded on next page)

STERLING
NO-CLOG PUMPING SAVES YOUR PROFITS!



For over 25 years, Sterling SRD* Self Priming Centrifugals have proved themselves the MOST DEPENDABLE PUMPS MONEY CAN BUY! They are heavy duty, rugged pumps. They WON'T STOP as long as they have fuel—WON'T CLOG—so water won't accumulate to ruin forms or cause costly damage—you save your profits! Sterling SRD* Pumps operate continuously all day, all night, under conditions that would certainly clog and stop many other types of self priming units!

From 1½" to 10"
4000 GPH to 200,000 GPH

NO-LEAK DOUBLE GREASE SEAL
LONG DISCHARGE PUMP VOLUTE
POSITIVE RECIRCULATION CUT-OFF VALVE
NO-CLOG TRASH HANDLING IMPELLER
easily adjusted, no wear plates needed!
plus many more important advantages

STERLING
MACHINERY COMPANY
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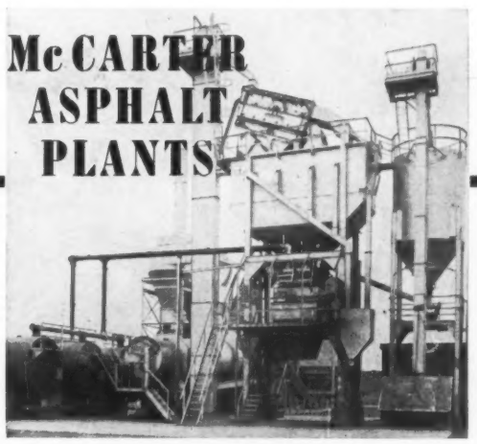
*S—SIMPLE
*R—RUGGED
*D—DEPENDABLE

SEE YOUR STERLING DEALER OR WRITE TODAY FOR CATALOG

McCARTER ASPHALT PLANTS



Truly Balanced Plants of 2000 to 6000-lb. Mixer Cap.

- McCarter . . . backed by 20 years' experience . . . designs and manufactures this equipment in their own works, assuring standardized parts and minimum costs.
- McCarter standard plants are readily adaptable to your special requirements. Individual units are also available.

DRYERS (Hot or hot and cold material, center outlet type)

MIXERS, ASPHALT BUCKETS (Steam, hot oil or electric heated)

AGGREGATE HOPPERS, BINS, APRON TYPE FEEDERS, CYCLONE COLLECTORS, ELEVATORS, STEEL STRUCTURES

REPAIRS AND MODERNIZING
We specialize in remodeling old plants for better production and more efficient operation.

CALL FOR ONE OF OUR ENGINEERS TO GO OVER YOUR PROBLEMS WITH YOU

Mc CARTER IRON WORKS, INC., Norristown, Pa.

HERE'S A FASTER, EASIER, CHEAPER WAY
TO HANDLE MORE DIRT, ROCK OR GRAVEL!

OMAHA STANDARD TRAILERS

The OMAHA STANDARD "CENTER DUMP" Trailer . . .

. . . Custom Built to Job Requirements is designed for contractors who want to haul dirt, gravel, rock, long or short distances, quickly and at low cost, for stock piling, spreading or dumping. Contractors say it is just what they have been looking for!

★ Each unit built to job requirements.
★ Available in sizes and lengths to meet all bridge and axle laws.
★ All *steel welded* body, chassis. Built to withstand roughest loading, toughest service.
★ Dumping mechanism FOOL-proof—trouble-FREE!
★ Release on doors INSTANT, SHOCK-PROOF, protected from material flow.
★ DOOR OPENING Meter control that can be *pre-set*.

Write at once for specifications and descriptive folder that will answer your questions and show how you can make every load a "profit" load. Address today Dept. A

OMAHA STANDARD FACTORY & GENERAL OFFICES
2411 West Broadway Council Bluffs, Iowa

Distributor Doings

(*Continued from preceding page*)

Washington. The staff and dockside facilities of NC Marine are conveniently located to serve representatives and offices of Alaskan canneries, as well as many individual fishing and work-boat owners who make their headquarters in Seattle.

Automotive Division

To serve the different areas of the north with passenger cars and trucks, the company has automotive sales, parts, and service facilities at Anchorage, Fairbanks, and Nome, Alaska, and at White Horse, Yukon Territory. Anchorage has two separate establishments, Anchorage Buick and Anchorage Motors, handling the Dodge-Plymouth line. At Nome, Fords are sold and serviced. White Horse handles the Canadian-made Ford and Monarch and enjoys a good service volume from Alcan Highway tourists. Mayo Branch handles Ford-Monarch in connection with its mercantile activities, and Dawson deals in Dodge-DeSoto the same way. The company handled both Mack and Kenworth heavy-duty trucks for all of Alaska and the Yukon. A great portion of the sales for these units results from construction work in the area.

Today's aviation activities in the sale of used planes, repair and service of aircraft, and gassing of planes with Standard Oil products is a fair-sized company operation. This work is carried on at facilities at Fairbanks International Airport. Due to the present defense emergency, Aeronca planes are not being manufactured, but many of these wheel and float models were placed in all parts of the territory for individual use when they were available.

Seattle, Home Office

Because of the geographical complexity of shipping and distribution in this vast territory, Northern Commercial maintains its home office in Seattle. Its main function is as a clearing house for the procurement of all requirements of the branches. It handles the shipping, expediting, and warehousing of machinery. The accounting and administration departments also operate from Seattle. Expediting is one of the most important functions of the Seattle office as far as branches like Anchorage are concerned.

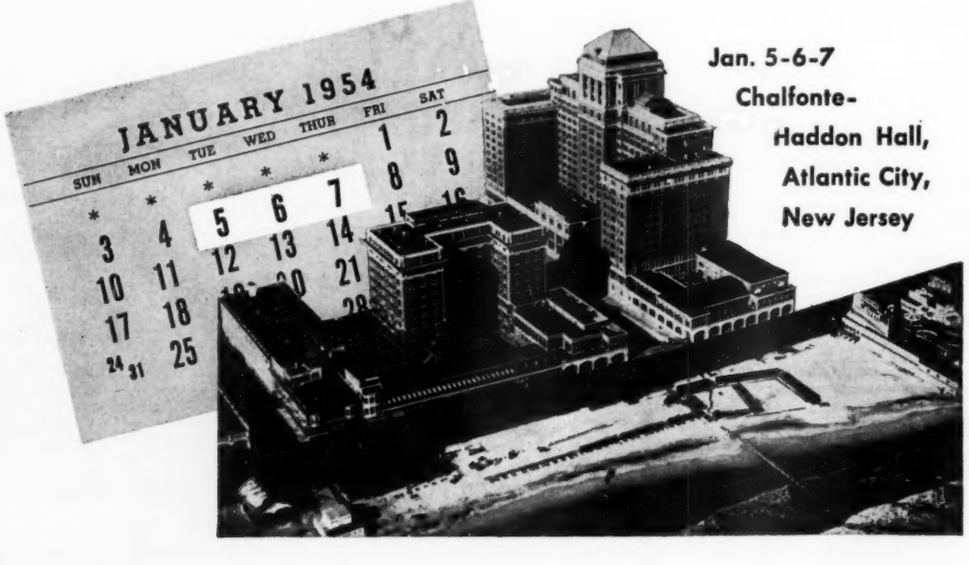
The Seattle office has a machinery department with a sales force which contacts all concerns, except marine, who have or contemplate work in Alaska. This department also operates a small shop of its own for preparing machinery for shipment, including accessory installations and small fabrication work.

Northern Commercial, already a vast operation, should enjoy even greater expansion in the future as Alaskan development is accelerated.

MAKE PLANS **NOW** TO ATTEND THE

1954 Annual Meeting

AMERICAN ROAD BUILDERS' ASSOCIATION



Jan. 5-6-7
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Haddon Hall,
Atlantic City,
New Jersey

★ **MEET** *Old Acquaintances — Make New Friends*
★ **HEAR** *Nationally-Known Speakers and Highway Authorities*
★ **LEARN** *What's New in Road Building, Maintenance and Administration*
★ **PROFIT** *From Technical Meetings, Papers, Reports, Panel Discussions*
★ **ENJOY** *Superb banquet—gala entertainment—Special events for ladies*

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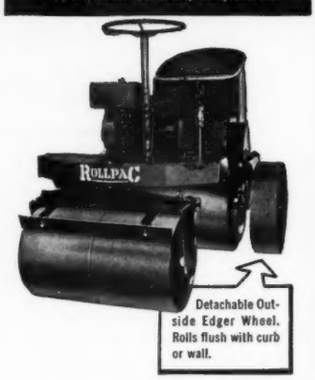
detailed information sent on request

AMERICAN ROAD BUILDERS' ASSOCIATION

WORLD CENTER BLDG., WASHINGTON 6, D. C.

SOIL-AIRE
ROLLPAC
Ruggedly built for heavy-duty service



A Standout Popular-Priced One Ton Roller. Send for Catalog.

SOILAIRE INDUSTRIES
Minneapolis 3, Minnesota
Sold by over 75 distributors in United States and Canada

Distributor Doings

Gar-Bro Names 14 Distributors

Fourteen distributors and two dealers have been named by the Gar-Bro Mfg. Co., 2415 E. Washington Blvd., Los Angeles 21, Calif., manufacturer of concrete-placing and materials-handling equipment. All are in the south and midwest.

The R. G. Moeller Company, Detroit and Kalamazoo, Mich., has been named to cover that state. New dealers in Michigan are Schuster Equipment Co., Inc., and W. E. Phillips Equipment, both of Detroit. Four distributors have been appointed in Ohio: The Bode-Finn Co., Cincinnati; Gibson Engineering Co., Cleveland; E. W. Harman Co., Columbus; and Howard T. Moriarity Co., Toledo. Central Supply & Equipment Co., Inc., Danville, is a new Kentucky distributor.

In Tennessee, the C. H. & L. Machinery Co. was appointed in Nashville. In Knoxville, Story Bros., Inc., was named, and the Nixon Machinery & Supply Co. was named in Chattanooga. Georgia will be covered by Tractor & Machinery Co., Inc., Atlanta.

Van Lott, Inc., West Columbia, South Carolina, will serve that state, and North Carolina will be covered by the E. F. Craven Co., Greensboro. The Southern Machinery & Supply Co., Roanoke, will handle Virginia, while the Washington, D. C., area will be covered by Power Equipment, Inc., Beltsville, Md.

Free State Equipment Co., Inc., Baltimore, has been appointed for Maryland.

Cleveland Contractors Moves

Cleveland Contractors Equipment Co. has moved into a new building on a 4½-acre site at 10904 Brookpark Rd., Cleveland 29, Ohio. At an open house held to celebrate the change, Le Roi Co., Milwaukee, Wis., manufacturer of compressors, industrial engines, and drills, unveiled its new front-end loader and a new model truck mixer. Le Roi distributors from surrounding communities attended the initial showing of equipment.

Cleveland Contractors, which covers northeastern Ohio, represents 21 equipment manufacturers in addition to Le Roi. M. F. Bradgon is president and general manager.

Mine & Mill Named by Cleco

Cleco Pneumatic Tool Division of Reed Roller Bit Co., Houston, Texas, has announced the appointment of Mine & Mill Machinery Co., Los Angeles, Calif., as distributor for Cleco products in its area. The manufacturer makes the Cleco and Dallett lines of air-powered tools.

Metelweld Equipment Booklet

A new bulletin, describing all the lines of construction equipment for which it is exclusive distributor, has been made available by the Construction Equipment Division of Metalweld, Inc., 2617 Hunting Park Ave., Philadelphia 29, Pa. The brochure also outlines the services Metalweld has to offer contractors and builders.

Southwood Appointed

Southwood Machinery Sales, Indianapolis, Ind., has been appointed exclusive distributor for the Wooldridge Mfg. Co., Sunnyvale, Calif., in the state of Indiana, excluding Lake, Porter, and La Porte counties. The firm will handle the Wooldridge line of earth-moving equipment, featuring self-propelled and tractor-drawn scrapers, cable-control units, rippers, and bulldozers.

Southwood recently moved its headquarters to a new, modern plant at Stop 12 on U. S. 31.

State Tractor Appointments

Ed Corn has been appointed secretary-treasurer of the State Tractor & Equipment Co., 407 S. 17th Ave., Phoenix, Ariz., dealers in construction, mining, and industrial machinery. He succeeds W. H. Bridges.

C. R. Templeton has assumed the duties of assistant sales manager after having been a sales representative for several years. Other additions to the State Tractor organization are Pat Hargrove and Maurice T. Mooney. Mr. Hargrove is handling industrial sales for Pima, Santa Cruz, and Cochise counties in Arizona. Mr. Mooney is doing similar work in Maricopa County.

Halsmith Is A-C Distributor

The Halsmith Co., 403 W. Ponce de Leon Ave., Decatur, Ga., has been named a distributor for Allis-Chalmers, Milwaukee, Wis., handling A-C motors, controls, and Texrope drive equipment for the northern part of Georgia. The concern, which was established earlier this year, covers a territory bounded on the north by the state line and on the south by the southern borders of Muscogee, Talbot, Taylor, Houston, Twiggs, Laurens, Johnson, Emmanuel, Jenkins, and Screven counties.

Lippmann Distributors

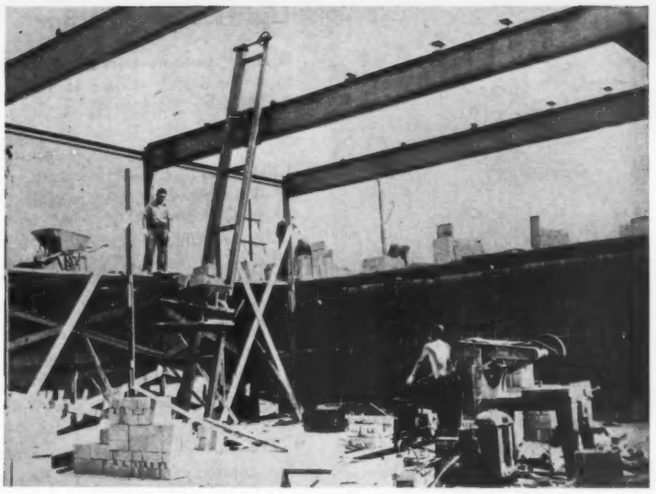
The Lippmann Engineering Works, 4603 W. Mitchell St., Milwaukee, Wis., has appointed three new dealers to handle its line of crushing, screening, and conveying machinery.

The Vancouver Equipment Corp., Ltd., 285 E. First Ave., Vancouver, B. C., will cover all of British Columbia. The Casey-Metcalfe Machinery Co., 5107 Telegraph Road, Los Angeles, Calif., will have the lower half of California as its territory. Pennsylvania will be served by the Highway Equipment Co., 840 S. 19th St., Harrisburg, Pa.

Marion Co. Appoints

The Marion Power Shovel Co., Marion, Ohio, has appointed two new distributors, the Tulsa Equipment Co., 1804 N. Lewis, Tulsa, Okla., and Neff-Thomas Machinery Co., 1920 NW Miami Court, Miami, Fla. The Tulsa Co. will handle Marion machine sales and servicing in Oklahoma. Neff-Thomas' territory covers the southern half of Florida.

Dealers—This is your department, so send your news—all about new plants, new lines, and staff changes.



The Incline Track materials elevator.

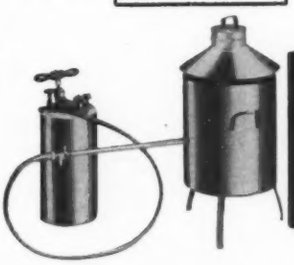
Materials Elevator Built from Parts Kit

■ An inclined-track materials elevator can be assembled on the job from parts furnished by the King Mfg. Corp., 3152 W. Chicago Ave., Chicago 22, Ill. The contractor can build his own track and platform using King reeving pulleys and the company's specially constructed platform carrier. Minimum stress on the incline makes it possible to use pine lumber to build the elevator, the manufacturer points out.

The Incline Track has a pulley arrangement giving a double line so that the pull at the hoist will not exceed 400 pounds. Therefore, any hoist with a single-line pull of 400 pounds or more can be used. Hoisting cable of ¼ of 5/16-inch thickness is suitable. The elevator can be used to hoist up to 1,000 pounds of material.

For further information write to the company, or use the Request Card at page 18. Circle No. 235.

WILL WINTER STOP YOU COLD?



AEROIL oil-burning Salamanders keep winter construction crews ON THE JOB even through the worst freeze-ups. Clean and economical, Aeroil Salamanders eliminate all the hazards of coke burners. You can solve your winter heating problem in a snap with Salamanders, Coil Type Water Heaters, and Concrete Heaters by Aeroil . . . *Write for free bulletin 210 RS.*

AEROIL PRODUCTS COMPANY, 75 WESLEY ST., SOUTH HACKENSACK, N. J.

THIS BOOK TELLS YOU HOW TO SAVE MONEY

—repointing dipper teeth
—rebuilding and hardfacing worn grousers
—welding manganese steel
plus many unique applications for manganese steel flats, rounds, squares and plate.
AND IT'S FREE!

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American Manganese Steel Division
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The new Kritzer reversible ripper mounted on the side of a tractor.

New Ripper Attachment

■ A ripper that mounts directly on the tractor and operates while the tractor is either in forward or reverse motion is available from Kritzer Equipment Co., Inc., 3843 W. Slauson Ave., Los Angeles 43, Calif. The Kritzer reversible ripper uses a standard ripper tooth and may be installed for either side or drawbar mounting. It is said to cut through most types of formations, including sandstone, decomposed granite, and hardpan.

The ripper is adjustable for digging depths between 8 and 16 inches. It operates without any special controls and may be used on any make of tractor.

For further information write to the company, or use the Request Card at page 18. Circle No. 202.

Army Engineers Promoted

Brig. Gen. Emerson C. Itschner, North Pacific division engineer in Portland, Oreg., since 1952, has been named to succeed Brig. Gen. Claude H. Chorpening as assistant chief of engineers for civil works at the Office of the Chief of Engineers, U. S. Army, Washington, D. C.

Replacing Gen. Itschner is Brig. Gen. Don G. Shingler, chief of staff and assistant commander of The Engineering Center, Fort Belvoir, Va., since 1952.

Lightweight Ditcher

■ A lightweight trencher that digs in 4 and 6-inch widths is made by the Charles Machine Works, 625-30 Birch St., Perry, Okla. The Model E Ditch-Witch trencher weighs only 1,200 pounds but digs a trench 24 to 30 inches deep at a rate of 8 to 10 fpm.

The machine is powered by a 12-hp gasoline engine and has a hydraulic feed in both directions. The spoils chute is reversible so that the spoils can be deposited on either side of the trench. The bucket line consists of alloy-steel buckets that are welded to a heavy-duty roller chain.

For further information write to the company, or use the Request Card that is bound in at page 18. Circle No. 204.

The Model E Ditch-Witch trencher.

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IN 12-INCH TO 12-FOOT WIDTHS
TO MEET REQUIREMENTS
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Wet concrete clings to the top of the vertical columns, and concrete and steel reinforcing wire cover the floor of a tank, following the collapse of a 15-inch wet concrete roof being poured at the Esso Standard Oil Co. plant in Everett, Mass. Two men were killed and 32 others injured when wooden underpinnings gave way and the roof caved in. Workers on the roof were hurled amid a mass of concrete and reinforcing steel onto men working inside the tank. *Wide World Photo*

Vibrators*

Modern construction standards demand high strength concrete. And to meet these standards, contractors rely on dependable vibrators.

Every vibrator company wants to build up its sales, and the overwhelming majority of vibrator manufacturers advertise in CONTRACTORS AND ENGINEERS.

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3. C&E carries more display advertisers than any other monthly, and,
4. more *exclusive* advertisers.

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The Basic Differences In Electric Generators

■ A booklet on the selection of engine-driven electric generating plants is available from D. W. Onan & Sons, Inc., University Ave., S. E., Minneapolis, Minn. The booklet describes the working principles and specific characteristics of ac, dc, and battery-charging electric plants.

Characteristics of the different types of engines that furnish mechanical power for driving generators are also discussed. The cost of operation and installation of each type and its advantages are also covered. Differences of engine cooling and starting methods are among the topics included in a summary of important points to remember.

To obtain this literature write to the company, or use the Request Card that is bound in at page 18. Circle No. 201.

Line of Tractor Covers

■ The Comfort heater line of covers for crawler tractors has been expanded to fit Allis-Chalmers and International Harvester tractors. More models for Caterpillar tractors are also available.

The new heaters are custom-fit to the tractors and accommodate dozers and other equipment. The manufacturer stresses that it is not necessary to cut holes in the heater to reach the starting motor, oil sticks, or other parts.

The covers have motor panels which can be folded back for heat control. Windshields are available at extra cost.

For further information write to Comfort Equipment Co., 2609 Walnut, Kansas City, Mo., or use the Request Card at page 18. Circle No. 182.

Electrode-Selector Chart

■ A new electrode-selector chart presents data on the complete line of G-E welding electrodes. The chart, designated GEC-657E, contains condensed information on the company's line of mild-steel, low hydrogen-low alloy, low alloy-high tensile, hard-surfacing, and stainless-steel electrodes.

The data includes tabulated material on welded properties, metal deposit analysis, technique, and the type of specification requirements met.

This literature may be obtained from the General Electric Co., Schenectady 5, N. Y., or by using the Request Card at page 18. Circle No. 171.

USE RIGHT BUCKET FOR THE JOB

Hayward makes all three—clamshell, electric motor, orange peel. A Hayward recommendation is unbiased.

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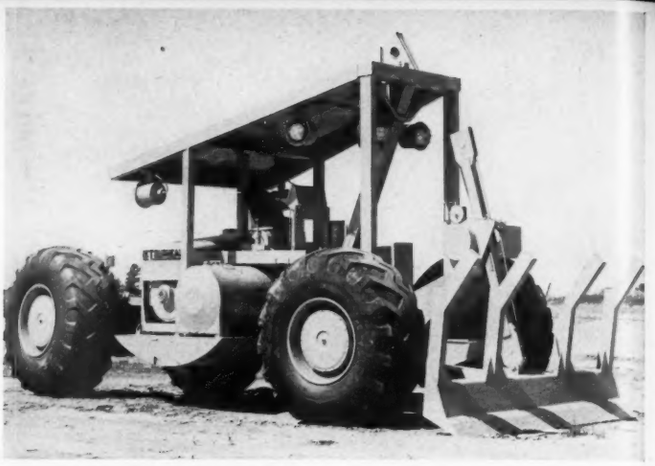
THE HAYWARD CO.,
32-36 Dey St., New York

Hayward Buckets

Above, the Tournasaw with the saw boom retracted. The saw boom is approximately 15 feet long and the pusher boom extends 20 feet beyond the front of the machine. At right, the LeTourneau LC tractor with special land-clearing blade. ►



Tractor-Mounted Blade And Powered Radial Saw for Land Clearing

■ R. G. LeTourneau, Inc., Longview, Texas, has marketed two new pieces of land-clearing equipment, a wheel-mounted tree-cutting saw and a specially-designed tractor that carries a land-clearing blade.

The Tournasaw has a 72-inch-diameter blade that cuts flush with the ground, up to 18 inches below the base of the machine, and as high as 6 feet 2 inches above the ground. The saw is on a boom that extends approximately 15 feet ahead of the machine. An antenna-like pusher-boom that reaches out 20 feet ahead guides the falling tree so that it will topple as desired.

For power, a GM 6-71 diesel engine drives a LeTourneau No. 3 ac generator mounted in line with the engine so that all machine functions are electrically controlled. LeTourneau ac electric motors are located at all points of power application, including motors in each wheel to provide individual drive. All four wheels are electrically steered. Spring-loaded brakes on each wheel's drive motor set automatically when the current is off and are magnetically released when current is applied.

The Tournasaw is 34 feet 8 inches long, with the saw boom retracted, and 14 feet 11 inches wide. It turns in a radius of 23 feet 6 inches. The machine runs on four 73-inch-OD tubeless tires and has a ground-clearance of 20 inches. Fuel tank capacity is 180 gallons.

The second of the new LeTourneau machines, the LC tractor, mounts a land-clearing blade that is 11 feet 3 inches wide and 4 feet high. The 2,410-pound blade can be raised 3 feet 6 inches above the ground and lowered 18 inches with down pressure. The tractor is powered by a GM 6-71 diesel engine with 186 maximum brake hp at 1,800 rpm. The engine drives a generator that makes the tractor, like the tree saw, all-electric in operation. A rear blade attachment is optional equipment.

Over-all length of the tractor with one blade is 25 feet 8 inches. It is 10 feet 10 inches wide and 14 feet 4 inches high. It rides on a 15-foot wheel-base and travels on four 73-inch-OD tubeless tires at 5 mph. Fuel tank capacity is 230 gallons.

LeTourneau, which sold its earth-moving machinery business to Westinghouse Air Brake Co., is now producing noncompetitive lines of equipment in its Vicksburg, Miss., and Longview, Texas, plants. It is preparing a new line of equipment for land-clearing, transportation, logging, marine, materials-handling, and other specialized markets. In addition to the land-clearing equipment mentioned here, it is also preparing to market rubber-tired trains capable of hauling heavy cargo over rough terrain, and mobile traveling cranes.

For further information write to R. G. LeTourneau, Inc., Longview, Texas, or use the Request Card at page 18. Circle No. 231.

Caterpillar Promotes

Burt Powell has been named advertising manager of the Caterpillar Tractor Co., Peoria, Ill., succeeding W. K. Cox. Mr. Cox is the new head of the sales promotion department, of which advertising is a division.

In a move toward decentralization of engineering functions, four engineering department personnel have assumed new duties. G. E. Burks is now director of engineering and is responsible for the coordination of Caterpillar's entire engineering program. John E. Jass succeeds Mr. Burks as chief engineer of the Peoria plant.

Paul B. Benner has been made an assistant chief engineer with supervision over design of motor graders and wheel tractors at the Peoria plant. Carl L. Kepner has been made an assistant chief engineer with supervision of earth-moving equipment now manufactured at the Joliet plant.

Link-Belt Names Rowand

Gordon W. Rowand has been appointed assistant sales manager of Link-Belt Speeder Corp., Chicago, Ill., manufacturer of power cranes, shovels, and draglines. His headquarters will be in Cedar Rapids, Iowa.

CUT COSTS WITH THIS HOPPER CONVEYOR!

FILLS CURBING, DITCHES, TRENCHES and PIPE LINES

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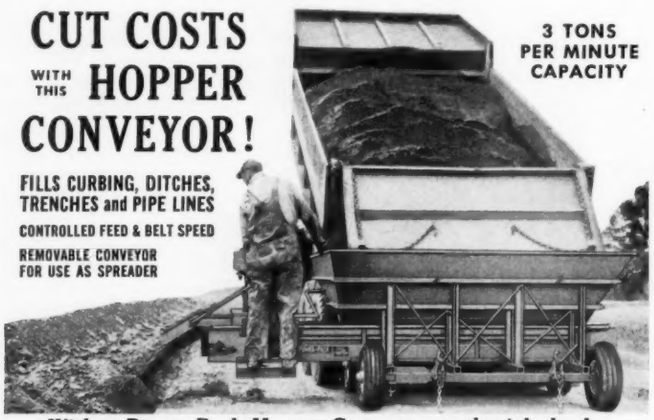

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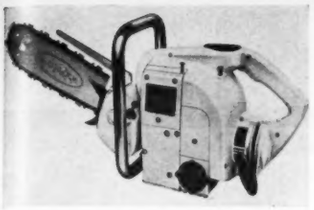

Lightweight Chain Saw

■ A new gasoline-powered chain saw that weighs 20 pounds complete with blade and chain has been announced by the McCulloch Motors Corp., 6101 W. Century Blvd., Los Angeles 45, Calif.

The lightweight Model 33 has an automatic clutch and rewind starter. All-gear transmission, fully enclosed flywheel, air filter, handlebars, and a muffler are other features of the saw. The company emphasizes that all parts normally requiring inspection, such as spark plugs or points, are easily accessible.

The saw has a new narrow-kerf Sabertooth chain and either 12 or 16-inch blades.

For further information write to the company, or use the Request Card at page 18. Circle No. 176.

Richmond Opens New Plant

The Richmond Screw Anchor Co., Inc., Brooklyn, N. Y., manufacturer of form-tying devices for concrete construction, have completed a new branch factory in St. Joseph, Mo., the first geographical expansion of the firm since its formation in 1911. The new plant is already in operation. It will serve to speed delivery of Richmond products to the midwest and far west.

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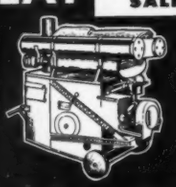

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1—H. K. Porter Locomotive, 36" gauge, close B.S., 10x16, Shop No. 6536.
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1—Model "C" Tournadozer, 1947, Serial No. LD 2013-02 powered with 180 h.p. Buda Diesel Engine and equipped with 11'4" Dozer Blade. Price: f.o.b. Parral, Ohio—$10,000.00

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1—Freese Model GC Auger Brick Machine with Pugmill Cutter, all pulleys and belts necessary for operation.
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1—Cat D7 Diesel Tractor, Ser. No. 3T4576, with Cat #25 CCU and Cat Radiator Shroud. Rebuilt and guaranteed.
1—Cat D8 Diesel Tractor, Ser. No. 8R9114, with LeTourneau DD CCU and La Plant Choate Angle Dozer. Rebuilt and guaranteed.
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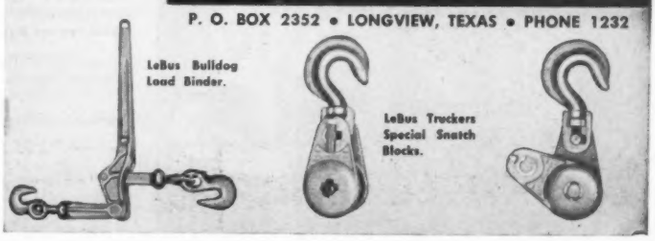

Manufacturer Memos

Koehring in Canada; Personnel Transfers

Final negotiations have been completed for the purchase of Canadian manufacturing facilities by Koehring Co., Milwaukee, Wis., manufacturer of power shovels, cranes, pavers, finishers, Dumptors, and Mud-Jacks. Formerly the Waterous Co., Ltd., Brantford, Ontario, Canada, the new subsidiary will be known as Waterous Koehring Co., Ltd.

Koehring has been interested in the Canadian market for some time because of the great expansion of that country's industry—especially in the oil, lumber, mining, and construction fields. Waterous Co. is an established Ontario firm which specializes in the production of road rollers, asphalt hot-mix plants, and related items. Production now is expected to continue along the same lines. As soon as possible, Koehring will establish additional assembly lines for the manufacture of its smaller excavators.

R. E. Bansemer, assistant sales manager of Koehring Co., has been named sales manager for Parsons Co., Newton, Iowa, a subsidiary of the parent firm. Mr. Bansemer has been with the company since 1923.

M. O. Messenger, sales manager at Parsons, has moved to Milwaukee, Wis., to take over the assistant sales manager's duties with the parent company. He has been a member of the Koehring organization since 1939.

Cleaver-Brooks Appoints

Elmer H. Wegner has been named general manager of manufacturing for the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis., manufacturer of boilers, industrial burners, and bituminous heating equipment. He will be assisted by Glenn W. Leupold, newly appointed works manager.

Formerly with the Ladish Co., Mr. Wegner joined Cleaver-Brooks earlier this year as director of purchases. Mr. Leupold was formerly works manager of two Heil Co. plants.

Robert R. Carver, Sprague & Henwood, Inc.

Sprague & Henwood Opens New Branch

Robert R. Carver has been appointed manager of the new western branch of Sprague & Henwood, Inc., Scranton, Pa., drilling contractors and manufacturers. The new office is located in Grand Junction, Colo.

Mr. Carver has been with Sprague & Henwood for six years. He has been assistant manager of the contract department in the home office for the past year. A graduate of the University of British Columbia, he is a licensed professional engineer in Pennsylvania.

As manager of the western branch, Mr. Carver is in full charge of several large contracts that Sprague & Henwood has with the U. S. Geological Survey and also of contracts with several private companies in the area.

Gar Wood Appointments

Glenn C. Wilhide was appointed Wayne division manager of Gar Wood Industries, Inc., Wayne, Mich. Mr. Wilhide held several executive positions with the U. S. Army and served as vice president and general manager of two subsidiaries of The Associated Gas & Electric Corp. He succeeds A. J. O'Brien, who resumes his duties as vice president of manufacturing.

Clair S. Reed has been elected vice president, director, and a member of the executive committee of the United Metal Craft Co., Ypsilanti, Mich., a subsidiary of Gar Wood Industries.

Mr. Reed joined Gar Wood a year ago as assistant to the executive vice president. He will continue in this capacity in addition to his new duties.

United Metal Craft Co. manufactures hydraulic truck equipment marketed by National Lift Co., another Gar Wood subsidiary, and component parts for products of other Gar Wood divisions.

Adm. Giles to Koppers

Rear Admiral Donald T. Giles, USN (Ret.), has joined Koppers Co., Inc., Pittsburgh 19, Pa., manufacturer of chemicals, coke, and asphalt mixes, as a development engineer. Admiral Giles, who recently completed his active duty with the Navy, will operate out of Atlanta, Ga. His naval service included engineering duty at shipyards and the experiment station at Annapolis.

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A few territories open for distributors 2

Waldo W. Neikirk, treasurer of the Dewey & Almy Chemical Co.

Dewey & Almy Elects

Waldo W. Neikirk has been elected treasurer of the Dewey & Almy Chemical Co., 62 Whittemore Ave., Cambridge 40, Mass. He will continue in his present position as controller.

Mr. Neikirk joined the firm in 1948 as assistant treasurer. He was appointed controller earlier this year.

Euclid Appoints Dix

John C. Dix has been appointed district manager of operations in Georgia, Alabama, Florida, and the eastern part of Tennessee for the Euclid Road Machinery Co., Cleveland 17, Ohio. He will make his headquarters in Atlanta, Ga.

Mr. Dix served several years with the Corps of Engineers, U. S. Army, and was graduated from the University of Denver. He will have five Euclid distributors, with a total of 14 sales and service offices, in his area. Tri-State, with offices in Albany, Atlanta, and Augusta, is the Georgia distributor. Alabama distributors are Ray-Brooks Machinery Co., Montgomery, and Tractor & Equipment Co., Birmingham.

The Florida-Georgia Tractor Co., handling Euclid equipment in Florida, maintains offices in Jacksonville, Lakeland, Miami, Orlando, Tampa, and Tallahassee. In Tennessee, Power Equipment Co. operates in Knoxville, Kingsport, and Chattanooga.

Poor Elects Armstrong

Victor C. Armstrong has been elected chairman of the board of directors of Poor & Co., 80 E. Jackson Blvd., Chicago, Ill. He fills the vacancy left by the death of Fred A. Poor.

Pioneer Engineering Works, Inc., Minneapolis, Minn., a subsidiary of Poor & Co., manufactures crushers, conveyors, and asphalt plants.

Gardner-Denver Elects

C. H. Rieman, associated with Gardner-Denver Co. for 16 years, has been appointed sales manager of the Mining and Construction Division. He has served as sales manager of the Mining Division and as district manager in Duluth, Minn.

Gardner-Denver, with main offices in Quincy, Ill., manufactures air compressors, hoists, rock drills, and rock drill accessories.

American-Marietta Acquires Universal Pipe

American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill., manufacturer of building materials, has acquired a controlling interest in the Universal Pipe Co., Columbus, Ohio. Universal becomes a subsidiary of American-Marietta by an arrangement which extends payment over a period of years. No American-Marietta stock was involved.

Tunneliner and Lo-Hed pipe of the Lamar Pipe & Tile Co. and the prestressed-concrete bridge sections of Concrete Products Co. of America, other American-Marietta subsidiaries, will be made available to Universal customers. Similarly, Universal's package bridges and precast flat-base pipe will be offered to Lamar and Concrete Products customers.

Drake Joins Metalweld

Charles R. Drake has joined the Construction Equipment Division of Metalweld, Inc., Philadelphia, Pa., in the capacity of sales engineer. He will service contractors and industrial accounts in Bucks County, Pa., and Mercer, Burlington, and Ocean counties, N. J.

Gar-Bro Chief Engineer

Les Garlinghouse, Jr., has been named chief engineer and production manager of the Gar-Bro Mfg. Co., 2415 E. Washington Blvd., Los Angeles 21, Calif., manufacturer of concrete-placing and material-handling equipment.

Moving earth for an underpass on the Ramona Freeway, near Ontario, California, Contractor J. A. Payton uses Caterpillar DW21 Tractors and No. 21 Scrapers.

The big yellow rigs haul average loads of 14 bank yards. They load in one minute, spread in 10 seconds, and make the 2-mile round trip in 9 minutes. That's good cycle-time for any earthmoving unit.

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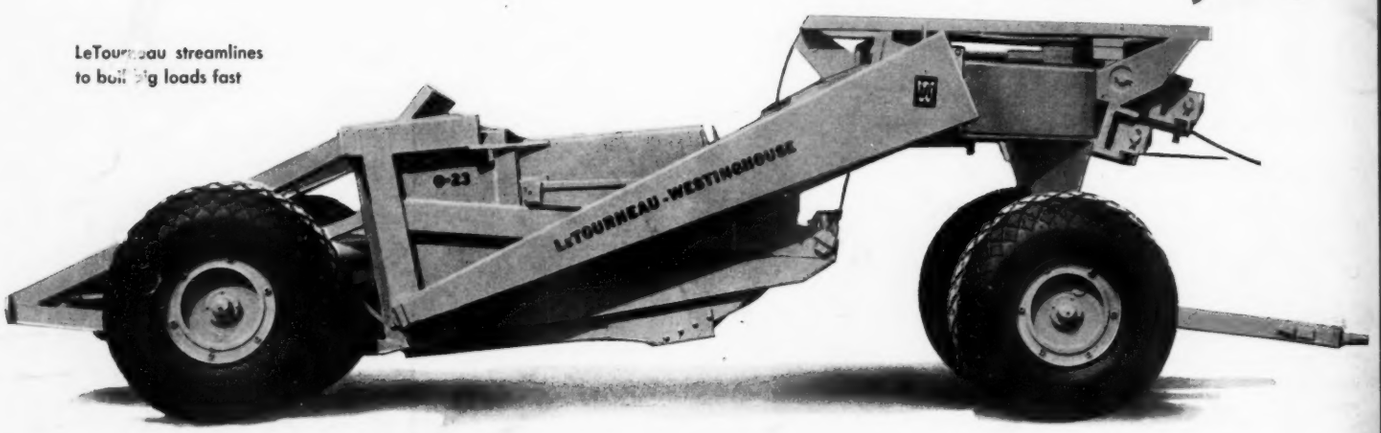

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